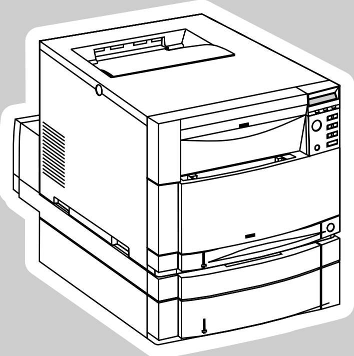

hp color LaserJet
4550/4500 series

service manual

achieve

HP Color LaserJet 4550/4550N/4550DN/4550HDN Printer and HP Color LaserJet 4500/4500 N/4500 DN Printer

Service Manual

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Part number: C7085-90921

First Edition, October 2000

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Conventions

This is a combined Service Manual for both the HP Color LaserJet 4500 series printer and the HP Color LaserJet 4550 series printer. The HP Color LaserJet 4550 series printer shares most characteristics of the HP Color LaserJet 4500 series printer, except where stated.

This manual uses the following conventions:

COLOR is used to emphasize items that are important to the material under discussion.

Bold is used for emphasis, particularly in situations where *italic* type would be confusing.

Italic type is used to indicate related documents or emphasis.

DISPLAY type indicates text as seen on the printer control panel display.

Commands you use on a computer keyboard or on the printer control panel are shown in `[Keycap]`. Two examples are `[Select]`, and `[-[Value +]`.

`COURIER` type indicates text that you type on a computer keyboard exactly as shown.

Hint Hints are used to suggest an action that might simplify the process.

WWW World Wide Web references give Internet addresses for additional information and information updates.

Note Notes contain important information set off from the text.

CAUTION Caution messages alert you to the possibility of damage to equipment or loss of data.

WARNING! Warning messages alert you to the possibility of personal injury.

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1 Printer description

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Printer features

The HP LaserJet 4500 printer family pictured in Figure 1-1 has three models.

- The HP LaserJet 4500 printer is the base model; it contains 32 MB of RAM.
- The HP LaserJet 4500 N printer is the base model with an HP JetDirect 600N print server (network card) and 64 MB of RAM.
- The HP LaserJet 4500 DN printer is the base model with an HP JetDirect 600N print server (network card), a 500-sheet paper feeder, a duplex unit, and 64 MB of RAM.

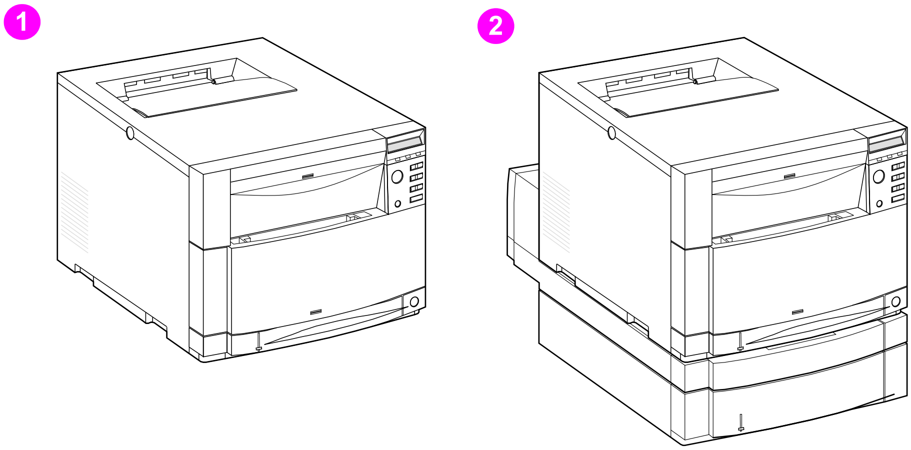


Figure 1-1 **HP Color LaserJet 4500 family printers**

1 HP Color LaserJet 4500 and 4500 N printers

2 HP Color LaserJet 4500 DN printer

The HP LaserJet 4550 printer family pictured in Figure 1-2 has four models.

- The HP LaserJet 4550 printer is the base model; it includes 64 MB of RAM.
- The HP LaserJet 4550N printer is the base model with an HP JetDirect 610N print server (network card) and 64 MB of RAM.
- The HP LaserJet 4550N printer is the base model with an HP JetDirect 610N print server (network card), a 500-sheet paper feeder, a duplex unit, and 64 MB of RAM.
- The HP LaserJet 4550N printer is the base model with a 6 GB hard drive, an HP JetDirect 610N print server (network card), a 500-sheet paper feeder, a duplex unit, and 64 MB of RAM.

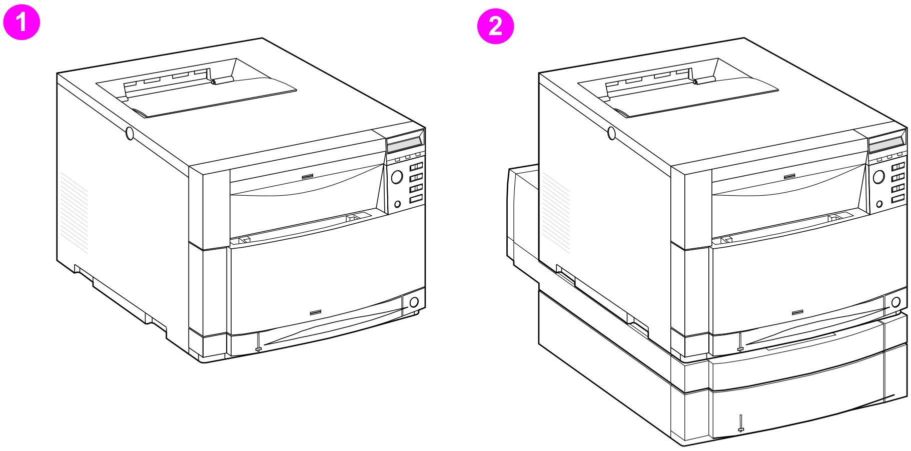


Figure 1-2 **HP Color LaserJet 4550 series printers**

1 HP Color LaserJet 4550 and 4550N printers

2 HP Color LaserJet 4550DN and 4550HDN printers

This printer series combines the quality and reliability of Hewlett-Packard printers with the features listed in Table 1-1.

WWW For more information about printer features, refer to the Hewlett-Packard website at http://www.hp.com.

Table 1-1 Printer features

Feature	Description
Connectivity	● Bidirectional parallel port (requires a “C” connector) ● Two enhanced input/output (EIO) slots ● Optional HP JetDirect 600N print server (network card) (included with the HP Color LaserJet 4500 N and 4500 DN printers) ● Optional HP JetDirect 610N print server (network card) (included with the HP Color LaserJet 4550N, 4550DN and 4550HDN printers) ● HP Color LaserJet 4550 series: Infrared receiver port ● HP Color LaserJet 4550 series: Embedded Web server
Duplex	● Optional duplex unit; mounts directly beneath the printer for two-sided printing (duplex unit is standard with the HP Color LaserJet 4500DN, 4550DN and 4550HDN) **Note** Requires 40 MB of memory; 64 MB of memory is recommended for optimal duplex printing. If the 500-sheet paper feeder (Tray 3) is installed, the duplex unit must be positioned between the printer and Tray 3.
Environmental	● PowerSave setting ● High content of recyclable components and materials
Fonts	● 80 internal fonts

Table 1-1 Printer features (continued)

Feature	Description
CPU	● The Color LaserJet 4500 series formatter PCB incorportates a 133 MHz RISC processor ● The Color LaserJet 4550 series formatter PCB incorporates a 233 MHz RISC processor
Memory—standard	HP Color LaserJet 4500 series: ● 32 MB RAM (Base) ● 64 MB RAM (HP Color LaserJet 4500 N/4500 DN) ● Memory Enhancement Technology (MEt), which automatically compresses data to use RAM more efficiently HP Color LaserJet 4550 series: ● 64 MB RAM (Base) ● 128 MB RAM (HP Color LaserJet 4550DN and HDN) ● Memory Enhancement Technology (MEt), which automatically compresses data to use RAM more efficiently
Memory—optional	● HP Color LaserJet 4500 series: Install 4, 8, 16, 32, or 64 MB DIMMs into the three DIMM slots to a possible total 208 MB. Synchronous SDRAM modules do not need to be configured in pairs (in corresponding left and right slots). If you install more than 208 MB of RAM, it will not be used by the printer. ● HP Color LaserJet 4550 series: Install 64 or 128 MB DIMMS into the two DIMM slots to a possible total of 192 MB. If you install more than 192 MB of RAM, it will not be used by the printer. ● HP Color LaserJet 4550 series: 5 GB hard disk drive (Included wit the HP Color LaserJet 4550HDN printer). **CAUTION:** The HP Color LaserJet 4500 series uses 100-pin, non-parity, SDRAM DIMMs. The HP Color LaserJet 4550 series uses 168-pin, non-parity, synchronous DRAM DIMMs. Extended Data Output (EDO) DIMMs are not supported.

Table 1-1 Printer features (continued)

Feature	Description
Paper handling—input tray capacity	The capacities will vary depending on the media being used (for example, transparencies, labels, heavy media, and envelopes). Quantities based on 75 g/m^2 (20 lb) media for both the HP Color LaserJet 4500 and 4550 printers: ● **Tray 1:** 150-sheet multipurpose tray ● **Tray 2:** 250-sheet standard cassette ● **Tray 3:** Optional 500-sheet paper feeder (included with the HP Color LaserJet 4500DN, 4550DN and HDN models)
Paper handling—output (face-down, correct-order output)	● Top output bin holds up to 250 sheets of standard paper. ● Rear output bin holds up to 100 sheets of standard paper. (The output of the rear output bin is in reverse order, facing up.)
Printer-language support	HP Color LaserJet 4500 series: ● HP PCL5c ● PostScript™ Emulation ● Automatic language switching HP Color LaserJet 4550 series: ● HP PCL 5c ● HP PCL 6 ● PostScript™ 3 Emulation ● Automatic language switching
Paper sizes supported	● A4/Letter ● Legal ● Executive ● JIS B5 ● A5 ● Custom (B5 ISO)
Print speed—monochrome printing	● 16 pages per minute (ppm) ● 8 ppm for transparencies, heavy paper, and glossy paper
Print speed—color printing	● 4 ppm ● 2 ppm for transparencies, heavy paper, and glossy paper
Standard interfaces	The printer comes equipped with two EIO slots. **Note** If the printer is not configured with a network interface card, connect the printer using a bidirectional parallel cable (IEEE-1284 compliant) with a “C” connector.

Identification

Model and serial numbers

The model number and serial numbers are listed on identification labels located on the rear of the printer. The model number is alphanumeric, such as C4084A for the HP Color LaserJet 4500. The serial number contains information about the country of origin, the printer version, production code, and the production number of the printer (see Figure 1-3). For information on determining the version of printer you are servicing, see page 140.

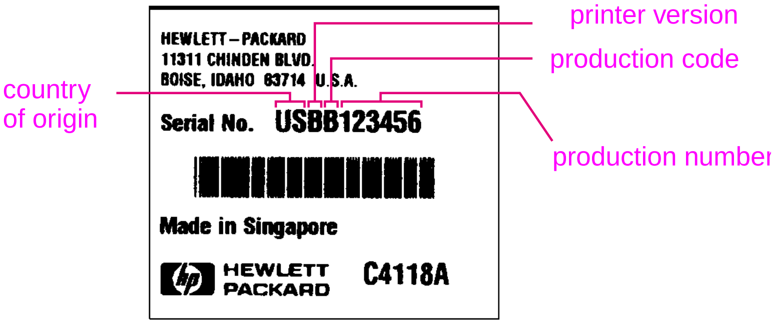

printer version
production code
country of origin
production number
HEWLETT–PACKARD
11311 CHINDEN BLVD.
BOISE, IDAHO 83714 U.S.A.
Serial No. USBB123456
Made in Singapore
HEWLETT PACKARD
C4118A

Figure 1-3 Model and Serial number information

Table 1-2 Model names and numbers

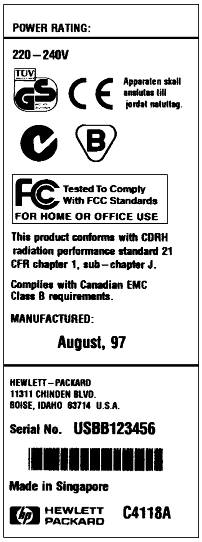
Model Name	Model Number
HP Color LaserJet 4500	C4084A
HP Color LaserJet 4500 N	C4089A
HP Color LaserJet 4500 DN	C4094A
HP Color LaserJet 4550	C7085A
HP Color LaserJet 4550N	C7086A
HP Color LaserJet 4550DN	C7087A
HP Color LaserJet 4550HDN	C7088A

Note Two versions of the HP Color LaserJet 4500 series printers are available. Before servicing the printer or ordering parts, you will need to identify which printer version you are servicing. For more information, see page 140. The HP Color LaserJet 4550 series printer, unless otherwise specified, is equivalent to the later version of the HP Color LaserJet 4500 series printer.

Power and regulatory information

The identification labels on the rear of the printer also contain power rating and regulatory information as shown in Figure 1-4.

CAUTION Converting the voltage on the printer can damage the printer. Do not use any voltage other than the operating voltage. Any attempt to convert operating voltages will void the product warranty (for example, attempting to change a 110V printer to a 220V printer).



POWER RATING:

220 – 240V

TÜV GS

Apparaten skall
anslutas till
jordat natuttag.

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

This product conforms with CDRH
radiation performance standard 21
CFR chapter 1, sub – chapter J.

Complies with Canadian EMC
Class B requirements.

MANUFACTURED:

August, 97

HEWLETT – PACKARD
11311 CHINDEN BLVD.
BOISE, IDAHO 83714 U.S.A.

Serial No. USBB123456

Made in Singapore

HEWLETT PACKARD C4118A

Figure 1-4 **Sample label**

Site requirements

The printer must be kept in a proper location to maintain the performance level that has been set at the factory. In particular, be sure that the environment adheres to the specifications listed in this chapter.

Below are recommendations for the printer location and placement.

Make sure the printer has the following:

- a well-ventilated, dust-free area
- a hard, level surface (not more than a 2° angle):
  - for the HP Color LaserJet 4500 and 4500N, the surface must support 51 kg (112 lb)
  - for the HP Color LaserJet 4500DN, the surface must support 77 kg (169 lb)
  - for the HP Color LaserJet 4550 and 4550N, the surface must support 51 kg (112 lb)
  - for the HP Color LaserJet 4550DN and 4550HDN, the surface must support 77 kg (169 lb)
- a level surface that supports all four corners of the 500-sheet paper feeder
- a constant temperature and humidity (Do not install near water sources, humidifiers, air conditioners, refrigerators, or other major appliances)

Make sure to keep the printer:

- away from direct sunlight, dust, open flames, or ammonia fumes.
- away from the direct flow of exhaust from air ventilation systems.
- away from walls or other objects. There must be enough space around the printer for proper access and ventilation. See Figure 1-5 on page 21.

Space requirements

The printer must have the following amounts of space above and around it.

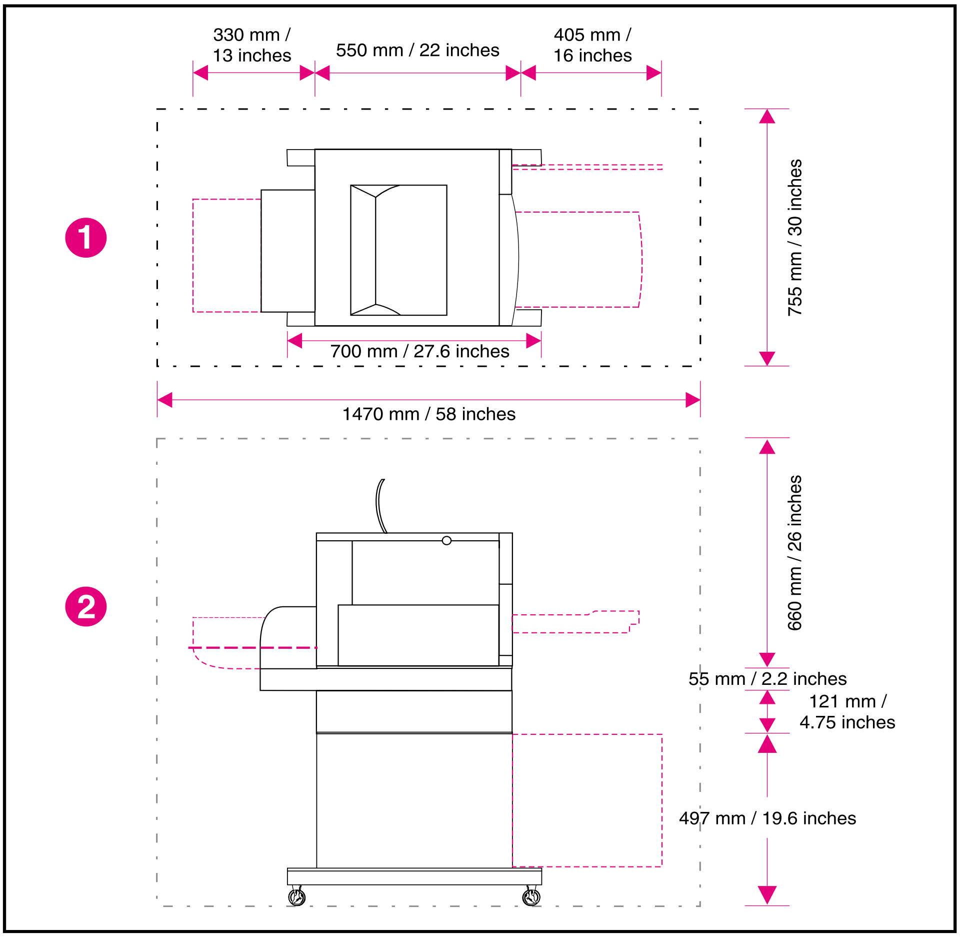

330 mm /
13 inches
550 mm / 22 inches
405 mm /
16 inches
755 mm / 30 inches
1
700 mm / 27.6 inches
1470 mm / 58 inches
660 mm / 26 inches
2
55 mm / 2.2 inches
121 mm /
4.75 inches
497 mm / 19.6 inches

Figure 1-5 **Space requirements**

1 Top view

2 Side view

Electrical specifications

Table 1-3 lists the electrical specifications required to run the printer safely.

Table 1-3 Electrical specifications

Item	110-volt models	220-volt models
Power requirements	100-127 V (+/- 10%) 50/60 Hz (+/- 2 Hz)	220-240 V (+/- 10%) 50/60 Hz (+/- 2 Hz)
Power consumption (typical)		
During printing	470 W (average)	480 W (average)
During standby*	80 W (average)	90 W (average)
During PowerSave	4500: 32 W	4500: 32W
Off	4550: 0 W	4550: 0 W
Minimum recommended circuit capacity for typical product	4500: 16.0 A at 120 V 4550: 10.2 A at 120 V	4500: 7.1 A at 220 V 4550: 5.1 A at 220 V

*When the printer is in standby (off) mode, it continues to consume a minimal amount of energy.

Note This information is preliminary and might not be current. Please see http://www.hp.com/support/lj4550 for current information.

Environmental specifications

Keep the printer within the environmental conditions shown in Table 1-4 for optimum performance.

Table 1-4 Environmental specifications

Item	Operating
Temperature	
Recommended	20° to 26° C (68° to 79° F)
Allowed	15° to 30° C (59° to 86° F)
Humidity	
Recommended	20% to 50% RH
Allowed	10% to 80% RH
Altitude	
Allowed	0 to 3100 m (0 to 10,000 ft)

Consumable storage requirements

The life of consumables is greatly affected by their storage environment. Use Table 1-5 to determine the shelf life of stored consumables.

Table 1-5 Consumable storage requirements

Item	Storage time	Storage condition
Temperature	Normal (maximum of 2.5 years)	0° to 35° C (32° to 95° F)
	Severe (maximum of 18 days)	High 35° to 40° C (95° to 104° F) Low 0° to -20° C (32° to -4° F)
Maximum temperature change rate	40° to 15° C (104° to 59° F) within 3 minutes -20° to 25° C (-4° to 77° F) within 3 minutes	
Humidity	Normal (maximum of 2.5 years)	35% to 85% RH
	Severe (maximum of 18 days)	High 85% to 95% RH Low 10% to 35% RH
Atmospheric pressure	460 to 760 mm Hg (18.1 to 29.9 in Hg)	
Average storage time	1 year	

Printer specifications

Table 1-6 describes the dimensions of the printer.

Table 1-6 Printer dimensions

	HP Color LaserJet 4500, 4500N	HP Color LaserJet 4500 DN	HP Color LaserJet 4550, 4500N	HP Color LaserJet 4550DN, 4550HDN
Height	395 mm (15.6 inches)	578 mm (22.8 inches)	395 mm (15.6 inches)	578 mm (22.8 inches)
Width	500 mm (19.7 inches)	500 mm (19.7 inches)	500 mm (19.7 inches)	500 mm (19.7 inches)
Depth	559 mm (22 inches)	709 mm (27.9 inches)	559 mm (22 inches)	709 mm (27.9 inches)
Weight	57 kg (125 lb)	75 kg (165 lb)	57 kg (125 lb)	75 kg (165 lb)

Table 1-7 lists the acoustic emissions of the printer when it is printing and when it is in standby mode.

Table 1-7 Acoustic emissions

	HP Color LaserJet 4500 Series	HP Color LaserJet 4550 Series
Operating position	Per ISO 9296, DIN 45635, T.19	Per ISO 9296, DIN 45635, T.19
Printing	L_{PA} 58 dB(A)	L_{PA} 56 dB(A)
Standby	L_{PA} 49 dB(A)	L_{PA} 48 dB(A)
Bystander 1m	Per ISO 7779, DIN 45635, T.19	Per ISO 7779, DIN 45635, T.19
Printing	L_{PA} 52 dB(A)	L_{PA} 52 dB(A)
Standby	L_{PA} 45 dB(A)	L_{PA} 44 dB(A)
Sound power	Per ISO 9296	Per ISO 9296
Printing	L_{WAd} = 6.6 bels(A)	L_{WAd} = 6.7 bels(A)
Standby	L_{WAd} = 5.8 bels(A)	L_{WAd} = 5.3 bels(A)

Note This product emits a sound intensity level, L_{WAd}, at 6.4 bel during printing. Do not place the printer in close proximity to users.

Maximum duty cycle is 35,000 pages per month.

Printer assemblies

Figures 1-6 and 1-7 show the location of each major assembly in the printer. These assemblies are described in Chapter 3.

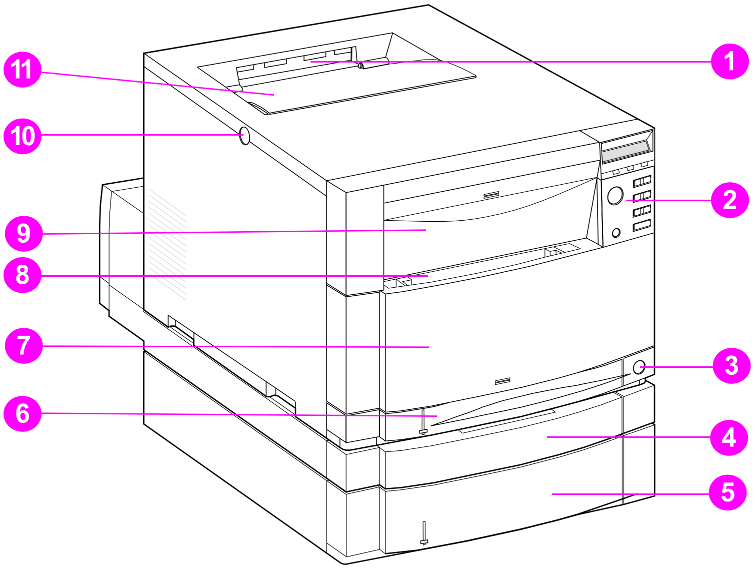


Figure 1-6 **Front view, HP Color LaserJet 4500 and HP Color LaserJet 4550**
(shown with 500-sheet paper feeder and duplex unit)

1	Top output bin
2	Printer control panel
3	Power switch (standby button)
4	Duplex unit drawer (optional on 4500, 4500N, 4550 and 4550N models)
5	Tray 3 (500-sheet tray; optional on 4500, 4500N, 4550 and 4550N models)
6	Tray 2 (250-sheets standard tray)
7	Intermediate Transfer Belt (ITB) drawer (transfer belt access)
8	Tray 1 (150-sheet multipurpose tray)
9	Drum drawer (imaging drum access)
10	Top cover release (toner access) button
11	Toner cartridge access cover

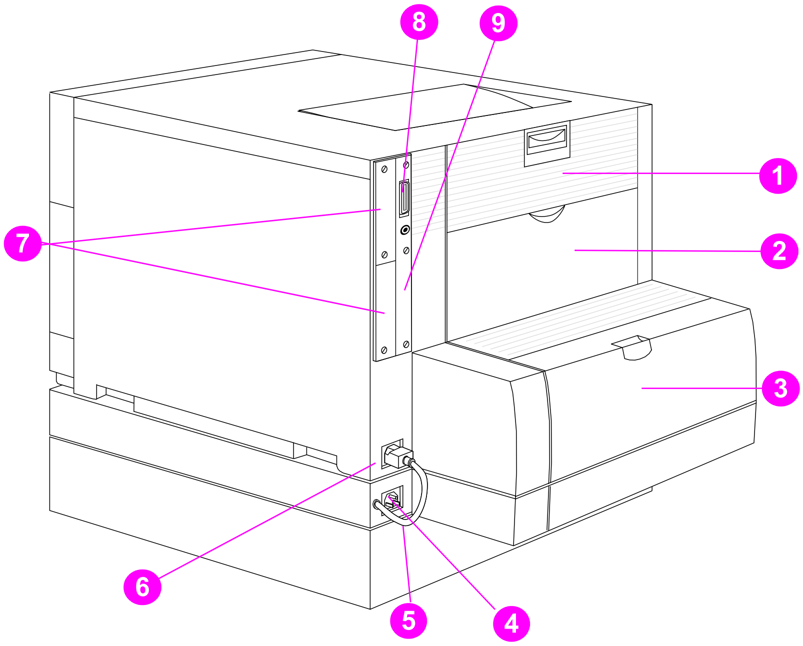


Figure 1-7 **Rear view, HP Color LaserJet 4500** **(shown with 500-sheet paper feeder and duplex unit)**

1	Rear door (fuser access)
2	Rear output bin door
3	Cover for duplex unit
4	Power receptacle for duplex unit
5	Duplex unit power cord to the printer
6	Printer power receptacle
7	EIO slots
8	Parallel connector (“C” connector)
9	Memory access

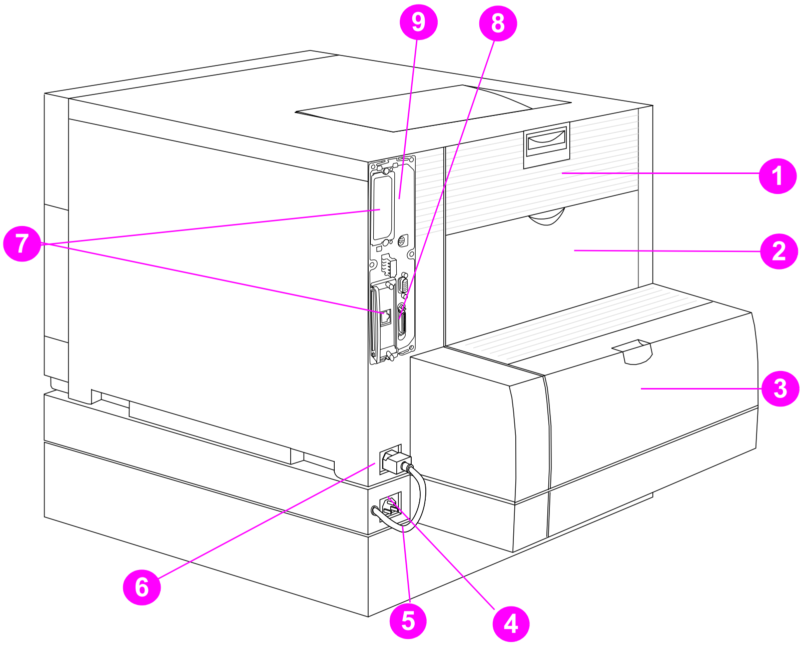


Figure 1-8 **Rear view, HP Color LaserJet 4550** **(shown with 500-sheet paper feeder and duplex unit)**

1	Rear door (fuser access)
2	Rear output bin door
3	Cover for duplex unit
4	Power receptacle for duplex unit
5	Duplex unit power cord to the printer
6	Printer power receptacle
7	EIO slots
8	Parallel connector (“C” connector)
9	Memory access

Media requirements

Selecting print media

You can use many types of paper and other print media with this printer. This section provides guidelines and specifications for selecting and using different print media.

Before purchasing any media or specialized forms in quantity, verify that your paper supplier obtains and understands the print media requirements specified in the *HP LaserJet Family Print Media Guide*. The guide is available through HP Direct. See the online user guide for ordering information.

It is possible that media could meet all of the guidelines in this chapter and still not print satisfactorily. This may be a result of abnormal characteristics of the printing environment or to other variables over which Hewlett-Packard has no control (for example, extremes in temperature and humidity).

Hewlett-Packard recommends testing any media before buying it in large quantities.

CAUTION Using media that does not conform to the specifications listed here and in the *HP LaserJet Family Print Media Guide* can cause problems that require service. This service is not covered by the Hewlett-Packard warranty or service agreements.

Media specifications

For optimum results, use conventional 75 g/m^2 (20 lb) xerographic paper. Verify that the paper is of good quality and is free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, curls, or bent edges. Avoid fanning the print media before loading it into the paper trays.

Supported media weights and sizes

Table 1-8 shows the media types and sizes supported by the printer and the printer accessories.

Table 1-8 Supported media specifications

Tray	Supported media	Media specifications	Capacity
Tray 1	Paper A4/Letter Legal Executive JIS B5 A5 Custom Minimum size: 76 by 127 mm (3 by 5 in) Maximum size: 216 by 356 mm (8.5 by 14 in)	Single-sided: If less than or equal to 148 mm width: 60 to 176 g/m^2 (16 to 47 lb) If more than or equal to 148 mm width: 60 to 135 g/m^2 (16 to 36 lb bond) Two-sided: 64 to 105 g/m^2 (17 to 28 lb bond)	150 sheets of 75 g/m^2 (20 lb) paper Do not load more than the maximum stack height of 15 mm (0.6 in)
	Transparencies A4/Letter Glossy Paper	0.13 mm (5 mil) 120 g/m^2 (32 lb/80 lb text)	Limit of 50 Limit of 50 sheets
	Envelopes (Tray 1 only) Com10 Monarch C5 DL B5 (JIS)	Maximum weight: 90 g/m^2 (24 lb bond)	Limit of 10
	Labels (Tray 1 only)		Limit of 50
	Cardstock (postcards) (Tray 1 only)	Maximum weight: 176 g/m^2 (47 lb bond) Maximum size: 200 mm by 148 mm (7.87 in by 5.82 in)	Do not load more than the maximum stack height of 15 mm (0.6 in)
Tray 2*	Paper A4/Letter Legal Executive JIS B5 A5 Custom (B5 ISO)**	Single Sided 60 to 105 g/m^2 (16 to 28 lb bond) Two Sided: 64-105 g/m^2 (17-28 lb. bond)	250 sheets of 75 g/m^2 (20 lb) paper
	Transparencies Glossy Paper	0.13 mm (5 mil) 120 g/m^2 (32 lb/80 lb text)	Limit of 50 transparencies Limit of 200 sheets glossy

Table 1-8 Supported media specifications (continued)

Tray	Supported media	Media specifications	Capacity
Tray 3* (optional)	Paper A4/Letter Legal Executive JIS B5 Custom (B5 ISO)**	Single Sided 60 to 105 g/m^2 (16 to 28 lb bond) Two Sided: 64-105 g/m^2 (17-28 lb. bond)	500 sheets of 75 g/m^2 (20 lb) paper
	Transparencies Glossy Paper	0.13 mm (5 mil) 120 g/m^2 (32 lb/80 lb text)	Limit of 50 transparencies Limit of 500 sheets glossy
Duplex printing accessory (optional)	Paper A4/Letter Legal Executive JIS B5	64 to 105 g/m^2 (17 to 28 lb bond)	

*Trays 2 and 3 do not support the range of custom sizes available in Tray 1.
**Trays 2 and 3 use custom size, specifically for B5 ISO.

Note Use only HP-supported transparencies (HP part number C2934A, Letter size; C2936A, A4 size).

Non-supported media

Use the following guidelines to avoid poor print quality or damage to your printer:

- Do not use paper that is too rough.
- Do not use paper that is embossed or coated unless it is specifically recommended for use in this printer.
- Do not use paper with cutouts or perforations other than standard three-hole punched paper.
- Do not use multipart forms.
- Do not use paper with irregularities such as tabs or staples.
- Do not use letterhead paper with low temperature dyes or thermography. Preprinted forms or letterhead must use inks that can tolerate temperatures of 190° C (374° F) for 0.1 second.
- Do not use any media that produces hazardous emissions, or that melts, offsets, or discolors when exposed to 190° C (374° F) for 0.1 second.
- Do not use paper that has already been printed on or fed through a photocopier or printer.
- Do not use paper with a watermark if you are printing solid patterns.
- Do not duplex on glossy paper. Doing so will result in jams and print-quality problems.
- Do not use transparencies that are not specified for use with HP Color LaserJet printers.

Printing on special media

Use these guidelines when printing on special types of media.

- For optimum results, use conventional 75 g/m^2 (20 lb) xerographic paper.
- Verify that the paper is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, curls, or bent edges.

Transparencies

When printing on transparencies, use the following guidelines.

- Do not send transparencies from Tray 2 to the rear output bin. The toner will be warm and may cause the transparencies to stick together.
- Send transparencies to the top output bin.
- Handle transparencies using the edges. Oils from your fingers can remain on the transparency and can cause print quality problems.
- Use only overhead transparencies recommended for use in this printer. Table 1-9 describes the recommended specifications for transparencies.

CAUTION Do not use DeskJet (inkjet) transparencies in this printer. The transparencies can become overheated and melt, causing serious damage to your printer. Hewlett-Packard recommends using HP Color LaserJet Transparencies with this printer. HP products are designed to work together for optimum printing results.

Table 1-9 Printing on transparencies

Description	Specifications
Electrical surface resistivity	2.0 to 15 by 10 ohms per square inch
Fusing compatibility	Materials must not discolor, melt, offset, or release hazardous emissions when heated to 190° C (374° F) for 0.1 second.
Caliper (thickness)	0.12 mm (0.0048 in) to 0.13 mm (0.0052 in)

Glossy paper

For optimum results when printing on glossy paper, select the glossy print setting in the printer driver. You can also use the printer control panel to set the media type to `GLOSS` for the input tray you are using. Because this setting affects all print jobs, it is important to return the printer to its original settings once your job has printed. See the section in the online user guide on configuring input trays.

Note Do not duplex on glossy paper. Doing so will result in jams and print quality problems.

Colored paper

Colored paper should be of the same high quality as white xerographic paper. Pigments used must be able to withstand the printer's fusing temperature of 190° C (374° F) for 0.1 second without deterioration. Do not use paper with a colored coating that was added after the paper was produced.

The printer creates colors by printing patterns of dots, overlaying and varying their spacing to produce various colors. Varying the shade or color of your paper will affect the shades of your printed colors.

Heavy paper

Use Tray 1 for paper that is 105-157 g/m^2 (28-42 lb bond). For optimum results when printing on heavy paper, select the heavy print setting in the printer driver. You can also use the printer control panel to set the media type to HEAVY for the input tray you are using. Because this setting affects all print jobs, it is important to return the printer to its original settings once your job has printed.

CAUTION Do not use paper that is heavier than the recommended specification for this printer. Doing so can cause misfeeds, jams, inferior print quality, and excessive mechanical wear. See Table 1-8 for supported paper types and sizes.

Envelopes

Envelopes can only be printed from Tray 1. For information about loading envelopes, see the section in the online user guide about loading envelopes into Tray 1.

Adhering to the following guidelines will help ensure proper printing of envelopes and help prevent printer jams:

- Do not load more than 10 envelopes into Tray 1.
- The weight rating of envelopes should not exceed 90 g/m^2 (24 lb).
- Envelopes should be flat.
- Envelopes must not be wrinkled, nicked, or otherwise damaged.
- Envelopes with peel-off adhesive strips must use adhesives that can withstand the heat and pressures of the printer's fusing process.
- Envelopes should be loaded with the flaps facing away from the printer and toward the left side of the printer.

CAUTION To prevent severe printer damage, do not use envelopes that have windows, clasps, snaps, or synthetic materials.

Labels

Note To print labels, Hewlett-Packard recommends configuring Tray 1 as a cassette and setting the tray's media type to LABELS in the printer control panel.

When printing labels, use the following guidelines:

- Verify that the label's adhesive material can tolerate temperatures of 190° C (374° F) for 0.1 second.
- Verify that adhesive material is not exposed between the labels. Exposed areas can cause labels to peel off during printing, which can cause printer jams. Exposed adhesive can also cause damage to printer components.
- Do not re-feed a sheet of labels.
- Verify that labels lie flat.
- Do not use labels that are wrinkled, bubbled, or otherwise damaged.

Preprinted forms and letterhead

Observe the following guidelines for best results with preprinted forms and letterhead.

- Forms and letterhead must be printed with heat-resistant inks that will not melt, vaporize, or release hazardous emissions when subjected to the printer’s fusing temperature of approximately 190° C (374° F) for 0.1 second.
- Inks must be non-flammable and should not adversely affect any printer rollers.
- Forms and letterhead should be sealed in a moisture-proof wrapping to prevent changes during storage.
- Before you load preprinted paper such as forms and letterhead, verify that the ink on the paper is dry. During the fusing process, wet ink can come off of preprinted paper.

Recycled paper

This printer supports the use of recycled paper. Recycled paper must meet the same specifications as standard paper; refer to the *HP LaserJet Family Print Media Guide,* available through HP Direct. See the online user guide for ordering information. Hewlett-Packard recommends that recycled paper contain no more than 5 percent groundwood.

Environmental Product Stewardship Program

Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally sound manner. This HP LaserJet printer has been designed with several attributes to minimize impacts on our environment.

This HP LaserJet printer design eliminates:

- **Ozone Emissions**—This product has been designed to minimize ozone emissions and avoid the need for an ozone filter.
- **CFC Usage**—Class I U.S. Clean Air Act stratospheric ozone-depleting chemicals (chlorofluorocarbons [CFCs], for example) have been eliminated from the manufacturing sites that produce this printer. This practice coincides with the 1987 “Montreal Protocol on Substances that Deplete the Ozone Layer” and its subsequent amendments. CFCs are not used in manufacturing of the packing.

This HP LaserJet printer design reduces:

- **Energy Consumption**—Energy usage drops significantly from printing mode to PowerSave mode.

  As an ENERGY STAR partner, Hewlett-Packard Company has determined that this product meets ENERGY STAR Guidelines for energy efficiency.

- **Paper Use**—The printer’s optional duplex printing accessory provides two-sided printing, reducing paper usage and the resulting demands on natural resources.

The design of this HP LaserJet printer facilitates the recycling of:

- **Plastics**—Major plastic parts have markings that enhance the ability to identify plastics for recycling purposes at the end of the printer’s life.
- **HP Toner Cartridges/Photoconductive Drum**—In many countries, this product’s toner cartridge/drum can be returned to HP at the end of its useful life. A prepaid shipping label and instructions on how to return the toner cartridge/drum are included with the replacement toner cartridge/drum. If your country is not listed in the replacement’s brochure, call your local HP Sales and Service Office for further instructions.

HP recycling program information:

This HP LaserJet printer also contributes to protecting the environment in the following ways:

- **HP LaserJet printing supplies**—In many countries, this product's printing supplies (e.g., toner cartridge, drum, fuser) can be returned to HP through the HP Planet Partners Printing Supplies Environmental Program. An easy-to-use take-back component of the program is available in over 25 countries.

  Multilingual program information and instructions are included in every new HP LaserJet Toner Cartridge and Consumables box.

- **HP Planet Partners printing supplies environmental program**—Since 1990, the HP LaserJet Toner Cartridge Recycling Program has collected more than 39 million used LaserJet toner cartridges that otherwise might have been discarded in the world’s landfills. The HP

LaserJet toner cartridges go to a collection center and are bulk-shipped to our recycling partners who disassemble the cartridge parts for recycling. Materials are separated and converted into raw materials for use by other industries to make a variety of useful products.

- **U.S. Recycling Returns**—For a more environmentally responsible return of used cartridges and consumables, HP encourages the use of bulk returns. Simply bundle two or more cartridges together and use a single, prepaid, and pre-addressed UPS label that is supplied in the package.

WWW

For more information, call (800) 340-2445 (U.S. only) or visit the HP LaserJet Supplies website at http://www.hp.com/ljsupplies/planet_index.html.

- **Non-U.S. Recycling Returns**—Non-U.S. customers should call the local HP Sales and Service Office for further information regarding availability of the HP Planet Partners LaserJet Toner Cartridge and Consumables Recycling Program.
- **Paper**—This printer is suited for the use of recycled papers (according to DIN 19 309) when the paper meets the guidelines outlined in the *HP LaserJet Family Print Media Guid*e.

For downloadable manuals, go to http://www.hp.com/support/lj4550. When you connect, select **Manuals**. The user guide is provided on CD-ROM, which allows the same high-quality information to be provided without consuming the large quantities of energy and natural resources required to produce traditional paper manuals.

To ensure longevity of your HP LaserJet printer, HP provides the following:

- **Extended Warranty**—HP SupportPack provides coverage for the HP hardware product and all HP-supplied internal components. The hardware maintenance covers a three-year period from date of the HP product purchase. HP SupportPack must be purchased by the customer within 90 days of the HP product purchase.

WWW

Information on HP SupportPack is available on the Web at http://www.hp.com/ under the HP Services and Support section. International customers can contact the nearest HP-authorized reseller about this service.

- **Spare Parts and Consumables Availability**—Spare parts and consumable supplies for this product will be made available for at least five years after production has stopped.

Regulatory statements

HP Color LaserJet 4500

For the most current regulatory statements regarding the HP Color LaserJet 4500 series, please see the HP Color LaserJet 4500 User Guide, or go to http://www.hp.com/cposupport/prodhome/hpcolorlas7857.html.

HP Color LaserJet 4550

For the most current regulatory statements regarding the HP Color LaserJet 4550 series, please see the HP Color LaserJet 4550 User Guide, or go to http://www.hp.com/support/lj4550.

Safety information

Laser safety statement

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration has implemented regulations for laser products manufactured since 1 August 1976. Compliance is mandatory for products marketed in the United States. The printer is certified as a “Class 1” laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.

Material Safety Data Sheet

The Toner Cartridge/Drum Material Safety Data Sheet (MSDS) can be obtained by visiting the website at http://www.ljsupplies.com/planetpartners/datasheets.html. International customers should see support information in this guide for appropriate phone numbers and information.

Toner safety

Hewlett-Packard encourages responsible disposal of HP LaserJet printer consumable items through its Environmental Collection Program. For details on this program, see the recycling instruction guide enclosed with each consumable item.

Note In case of toner spills, skin and clothing are best cleaned by removing as much toner as possible with a dry tissue, then washing with cold water. Hot water causes toner to permanently set into clothing.

Laser statement for Finland

LASERTURVALLISUUS

Luokan 1 laserlaite

Klass 1 Laser Apparat

HP LaserJet 4500, 4550-laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle.

Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

VAROITUS !

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING !

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

HUOLTO

HP LaserJet 4500, 4550-kirjoittimen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Tällaiseksi huoltotoimenpiteeksi ei katsota väriainekasetin vaihtamista, paperiradan puhdistusta tai muita käyttäjän käsikirjassa lueteltuja, käyttäjän tehtäväksi tarkoitettuja ylläpitotoimia, jotka voidaan suorittaa ilman erikoistyökaluja.

VARO !

Mikäli kirjoittimen suojakotelo avataan, olet alttiina näkymättömälle lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

VARNING !

Om laserprinterns skyddshölje öppnas då apparaten är i funktion, utsättas användaren för osynlig laserstrålning. Betrakta ej strålen.

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus 770-795 nm

Teho 5 mW

Luokan 3B laser

2 Service approach

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Service approach

Printer repair normally begins by using the printer's internal diagnostics and the three-step process below.

Step 1 Isolate the problem to the major system (for example, the host computer, the network or server, or the printer system).

Step 2 Determine if the problem is located in the accessories or in the printer engine.

Step 3 Troubleshoot the problem using the procedures in Chapter 7.

Once a faulty part is located, the printer can usually be repaired at the assembly level by replacing field replaceable units (FRUs). Some mechanical assemblies might need to be repaired at the subassembly level. Hewlett-Packard does not support replacement of components on the printer circuit assembles.

Parts and supplies

Ordering parts

Field replaceable and accessory part numbers are found in Chapter 8 of this manual. Replacement parts can be ordered from HP's Commercial Support Services Organization-Americas (CSSO-A) or HP's Commercial Support Services Organization-Europe (CSSO-E).

Note Use only accessories specifically designed for this printer. Accessories can be ordered from an authorized service or support provider. See "Ordering related documentation and software" on page 43 and "Ordering parts" on page 325 for additional ordering information.

By phone:

- Commercial Support Services Organization-Americas (CSSO-A)
  (1)(800) 227-8164 (U.S. only)
- Commercial Support Services Organization-Europe (CSSO-E)
  (49) (070) 3114-2253

By mail:

Hewlett-Packard Company
CSSO-A
8050 Foothills Blvd.
Roseville, CA 95678

Hewlett-Packard Company
CSSO-E
Wolf-Hirth Straße 33
D-7030 Böblingen, Germany

Ordering consumables

Consumables can be ordered directly from Hewlett-Packard. The phone numbers for ordering consumables are:

- U.S. (800) 538-8787
- Canada (800) 387-3154; Toronto (416) 671-8383
- United Kingdom 0734-441212
- Other local phone numbers may also be available

Exchange program

HP offers remanufactured assemblies for some parts. These are identified in Chapter 8 and can be ordered through Commercial Support Services Organization-Americas (CSSO-A) or Commercial Support Services Organization-Europe (CSSO-E).

Consumables

Paper and toner cartridges can be ordered directly from Hewlett-Packard. See Chapter 8 for ordering information.

World Wide Web

Printer drivers, updated HP printer software, and product and support information can be obtained from the following URL:

in the U.S.http://www.hp.com/go/support

Printer drivers may be obtained from the following sites:

In China:ftp://www.hp.com.cn/go/support
In Japan:ftp://www.jpn.hp.com/go/support
In Korea:http://www.hp.co.kr/go/support
In Taiwan:http://www.hp.com.tw/go/support
or the local driver website http://www.dds.com.tw

HP Service Parts Information Compact Disc

This powerful, CD-ROM-based parts information tool is designed to give users fast, easy access to parts information such as pricing and recommended stocking lists for a wide range of HP products. To subscribe to this quarterly service in the U.S. or Canada, call (800) 336-5987. In Asia Pacific, call (65) 740-4484. Parts identification and pricing information can also be checked via the World Wide Web at http://www.hp.com/go/partsinfo.

HP Support Assistant Compact Disc

This support tool offers a comprehensive online information system designed to provide technical and product information about HP products. To subscribe to the quarterly service in the U.S. or Canada, call (800) 457-1762. In Hong Kong, Indonesia, Malaysia, or Singapore, call Mentor Media at (65) 740-4477.

Ordering related documentation and software

Table 2-1 shows where to order related documentation and software. Telephone numbers for the various sources are:

- Commercial Support Services Organization-Americas (CSSO-A)
  (800) 227-8164 (US only)
- Commercial Support Services Organization-Europe (CSSO-E)
  (49) (070) 3114-2253
- HP Distribution Center (HPD) (661) 257-5565.
  Fax: (805) 257-6995

Table 2-1 Related documentation and software

Description	Part Number	CSSO-A	CSSO-E	HPD
HP LaserJet Family Print Media Guide	5963-7863			X
HP JetDirect Print Server Administrator's Guide	5969-6818	X	X	
Technical reference package	5021-0377	X		
HP Color LaserJet 4500 Printer Drivers Disk	C4084-60122			
HP Color LaserJet 4500, 4500 N documentation bundle (quick reference guide and getting started guide)	C4084-99021	X		
HP Color LaserJet 4500 DN documentation bundle (quick reference guide and getting started guide)	C4094-99020	X		
HP LaserJet 4550 Series Getting Started Guide	C7085-90901	X		
HP Color LaserJet 4550/4500 Series Quick Reference Service Guide	5963-7921	X		
HP LaserJet 4550/4500 Series Service Manual	C7085-90921	X	X	
HP Color LaserJet 4550/4500 Series Printer Service and Support CD-ROM	C7085-60102	X	X	
HP Color LaserJet 4550 Series Printer Online User Guide	C7085-60101			

Warranty statement

Hewlett-Packard warranty statement

HP Color LaserJet 4500,1 year limited warranty
4500 N, 4500 DN Printer and 4550/4550N/4550DN/4550HDN Printer

1. HP warrants HP hardware, accessories and supplies against defects in materials and workmanship for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.
2. HP warrants that HP software will not fail to execute its programming instructions, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.
3. HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, customer will be entitled to a refund of the purchase price upon prompt return of the product.
4. HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.
5. The warranty period begins on the date of delivery or on the date of installation if installed by HP. If customer schedules or delays HP installation more than 30 days after delivery, warranty begins on the 31st day from delivery.
6. Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.
7. TO THE EXTENT ALLOWED BY LOCAL LAW, THE ABOVE WARRANTIES ARE EXCLUSIVE AND NO OTHER WARRANTY OR CONDITION, WHETHER WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED AND HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE.
8. HP will be liable for damage to tangible property per incident up to the greater of $300,000 or the actual amount paid for the product that is the subject of the claim, and for damages for bodily injury or death, to the extent that all such damages are determined by a court of competent jurisdiction to have been directly caused by a defective HP product.
9. TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE CUSTOMER’S SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE.
10. FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND: THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

To ensure longevity of your HP LaserJet printer, HP provides the following:

Onsite service agreements

To provide you with the support level best suited to your system usage and support budget, HP has onsite service agreements with three response times:

Priority Onsite Service is designed for production-critical applications, giving you four-hour service response to your site for calls made during normal HP business hours.

Next Day Onsite Service provides onsite support by the next working day following your service request. Extended coverage hours and extended travel beyond HP designated service zones are available for additional charges on most on-site service agreements.

Weekly (Volume) Onsite Service Agreement, for organizations with many HP LaserJet printers, provides economical, scheduled on-site coverage. Designated for customer sites using 25 or more workstation products, this service provides scheduled weekly repair visits to your central location. HP can write an agreement for any combination of 25 or more workstation products including printers, plotters, computers, and disk drives.

For more information on HP service agreements, call (800) 835-4747 (U.S.) or (800) 268-1221 (Canada).

3 Installation and configuration

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Unpack the printer

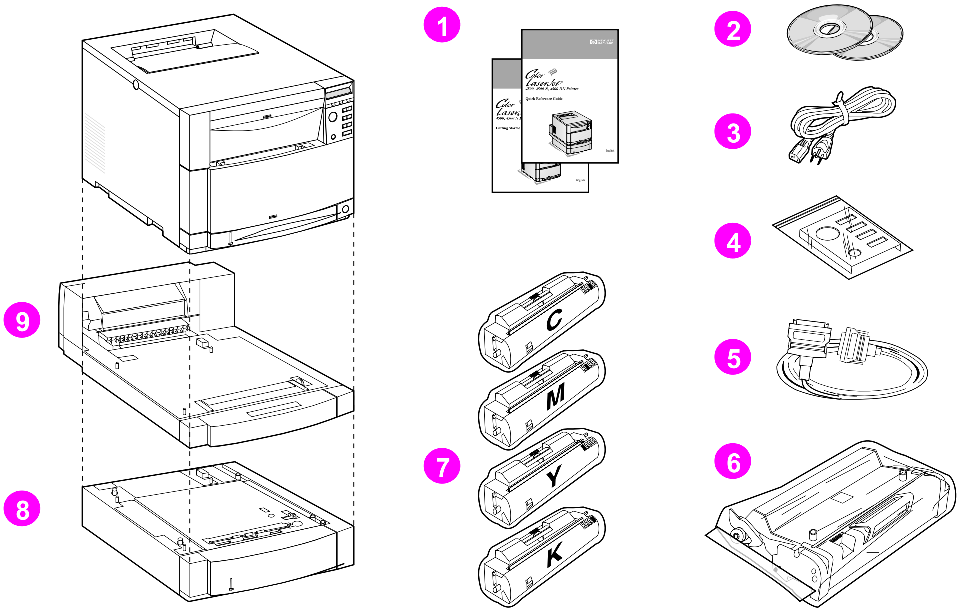


Figure 3-1 Package contents

Package contents

The following items are included with the printer:

1 Printer guides: getting started guide (HP Color LaserJet 4500 and 4550) and quick reference guide (HP Color LaserJet 4500 only)

2 Software CD-ROMs (including printer drivers and software, network administrator utilities, online user guide, and the *HP JetDirect Print Server Installation Guide*)

3 Power cord

4 Control panel overlay (for non-English language users)

5 Parallel cable (only included with the HP Color LaserJet 4500 and 4550 base model printer)

6 Imaging drum

7 Four toner cartridges: cyan (C), magenta (M), yellow (Y), and black (K)

8 Tray 3 (500-sheet paper feeder, included only with the HP Color LaserJet 4500DN, 4550DN and 4550HDN printers)

9 Duplex unit (included only with the HP Color LaserJet 4500DN, 4550DN and 4550HDN printers)

Unpacking the printer

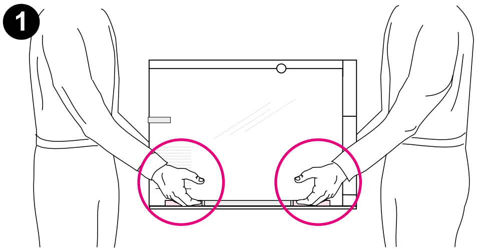
Note

Save all of the packing materials in case you need to repack and transport the printer at a later date.

WARNING!

The base and N model printers weigh approximately 57 kg (125 lb). The DN model weighs 77 kg (169 lb) with Tray 3 and the duplex unit installed.

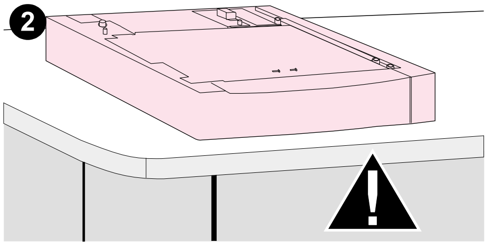
HP recommends having two or more people lift or move any of the printers.



1 Using safe lifting techniques, remove the printer and the printer accessories from the box.

CAUTION

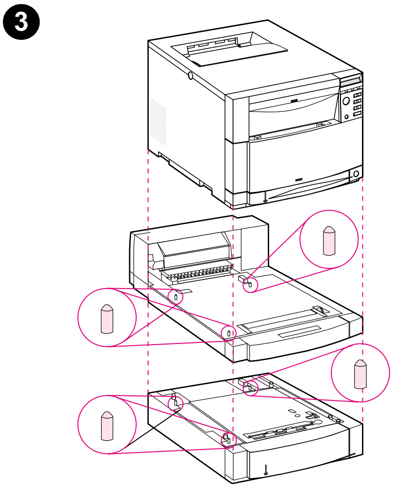
The prepared location must be level (not more than a 2° angle), able to support up to 77 kg (169 lb), and must support all four corners of the 500-sheet paper feeder (serves as printer base).



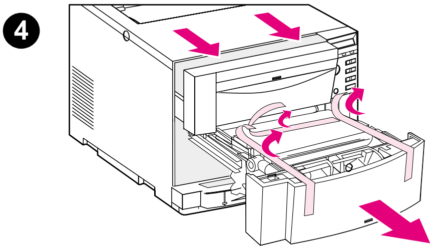
2 Place the 500-sheet feeder in the prepared location.

CAUTION

Avoid bending the guide pins while assembling the printer.

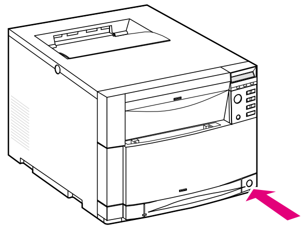


3 Using the guide pins for proper alignment, carefully assemble the printer and accessories.pen the ITB drawer and remove the packing tape, then close the drawer.



4 Open the ITB drawer and remove the packing tape, then close the drawer.

①



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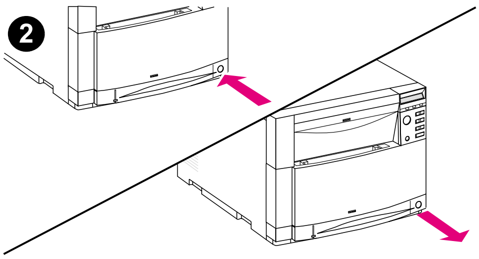

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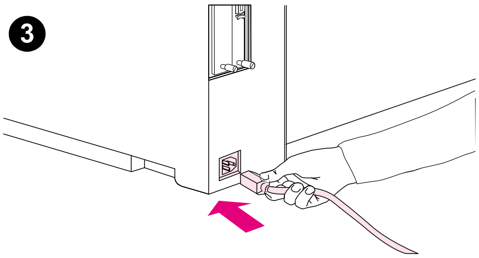
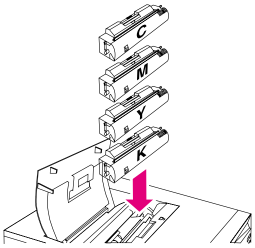


Attaching the power cord

1. Locate the standby button (power switch) on the front of the printer.
2. The standby button has two positions: in (power on) and out (standby mode—the fans remain on). Make sure that the standby button is out (standby mode).
3. Locate the power cord on the back side of the printer for the HP Color LaserJet 4500, 4500N, 4550 and 4550N printers or on the duplex unit for the HP Color LaserJet 4500DN, 4550DN and 4550HDN printers. Connect the power cord to the power receptacle on the back of the printer.

①



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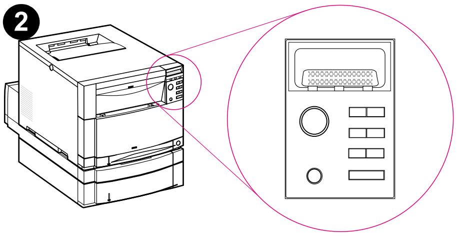

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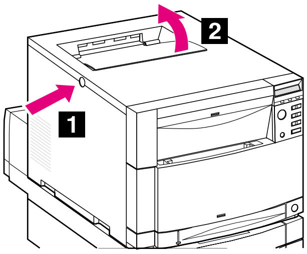


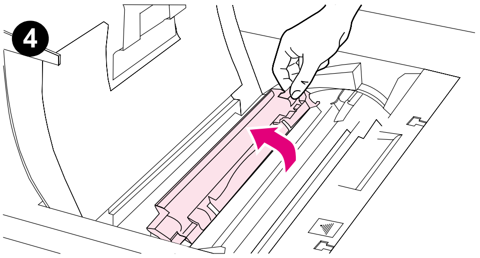
Installing the toner cartridges—for older version HP Color LaserJet 4500 printers

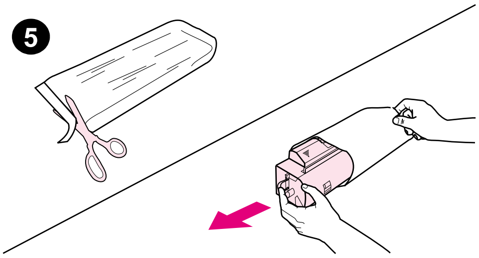
Note
The following instructions are for older versions of the 4500 series printers (see page 140 to determine which version of the printer you have). See page 55 for instructions for installing toner cartridges in newer version 4500 series and 4550 series printers.

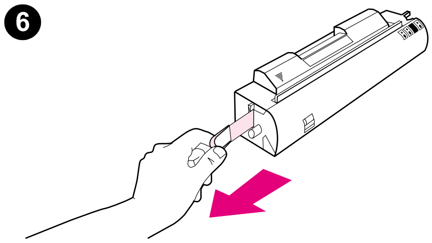
1. Locate the toner cartridges packaged in the printer box. The printer uses four different toner colors and has a different toner cartridge for each color: K = black, M = magenta, C = cyan, and Y = yellow.
2. Close all the doors and drawers on the printer. If the printer is not already turned on, turn it on. Wait for the printer to warm up. When it is ready, the control panel displays: `TONER POSITION CYAN = MISSING`.

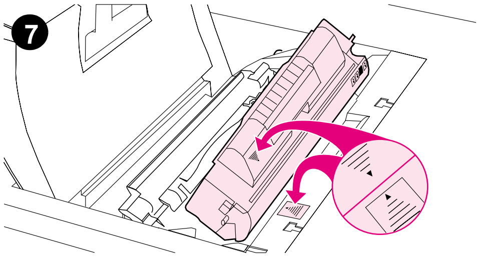
Note
If the `INSTALL DRUM` message appears, wait for the `INSTALL TONER CARTRIDGE` message, then proceed with the following instructions.

3. Push the dark gray release button on the side of the printer ([1]) and open the top cover ([2]).









4 The cartridge slot for the black toner cartridge is visible. Lift up the flap that partially covers the cartridge slot. The correct toner color is shown on the flap.

CAUTION

Do not shake the toner cartridges after removing them from the packaging.

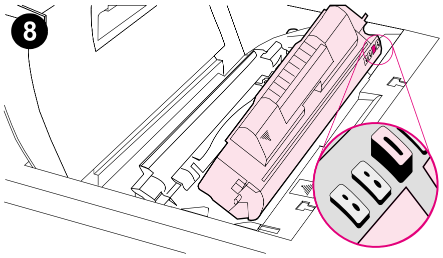
5 Remove the cyan toner cartridge from the bag. Gently rotate the toner cartridge from side to side to redistribute the toner.

6 Remove the inside sealing tape by firmly pulling the orange tab located on the end of the toner cartridge. (If the tab breaks off, pull on the tape.)

CAUTION

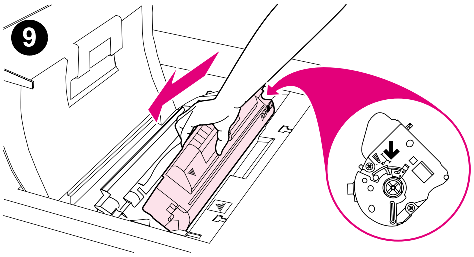
Do not shake the toner cartridge after you have removed the inside tape. Doing so could cause toner to spill.

7 Position the toner cartridge over the cartridge slot so that the blue arrow on the toner cartridge points to the blue arrow on the printer.

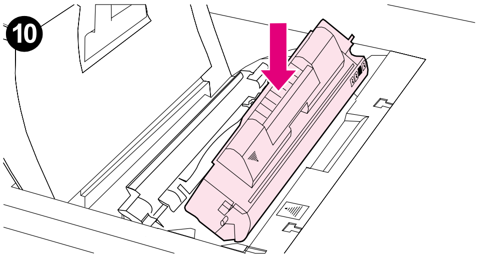


8 Make sure that the tab on the other end of the toner cartridge aligns with the notch on the cartridge slot.

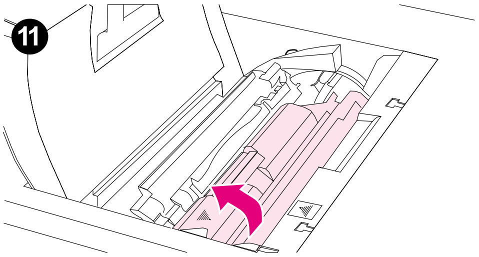
Note
If the tab does not fit in the notch when you insert the toner cartridge, the toner is the wrong color for that cartridge slot.



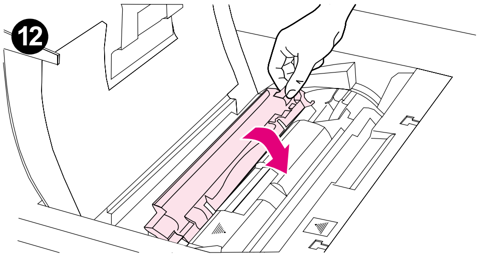
9 Hold the toner cartridge so that the arrow on the right side of the cartridge (the control panel side of the printer) points straight down.



10 Slide the toner cartridge down into the slot until the cartridge stops.



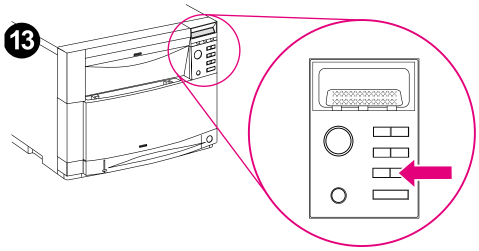
11 Rotate the toner cartridge toward the back of the printer (within the cartridge slot) until the cartridge stops. The cartridge shutter opens to reveal the developer sleeve.



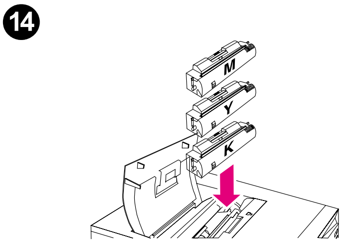
12 Lower the flap to partially cover the toner cartridge and close the top cover.

Note

You must close the top cover before installing the next toner cartridge.

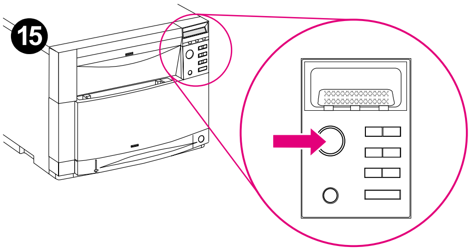


13 On the printer control panel, press [VALUE +] once to prepare the printer for installation of the next toner cartridge. When the printer is ready, the control panel displays:
`TONER POSITION`
(color) `= MISSING`



14 Install the other three toner cartridges by repeating steps 3 through12. Install the cartridges in the following order:

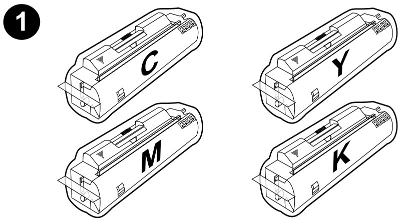
1. black (K)
2. magenta (M)
3. cyan (C)
4. yellow (Y)

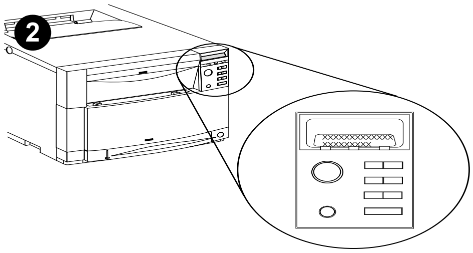


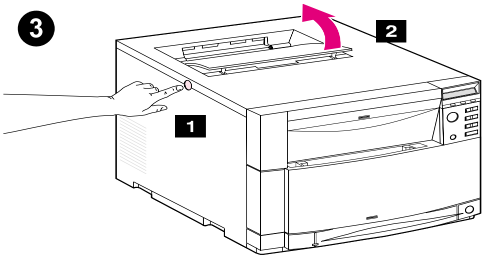
15 After installing the fourth toner cartridge, close the top cover and press [GO]. Wait while the printer runs an internal color calibration. The calibration takes a few minutes. When the printer is ready, the control panel displays: `READY`.

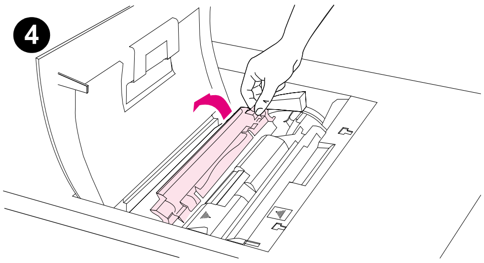
CAUTION

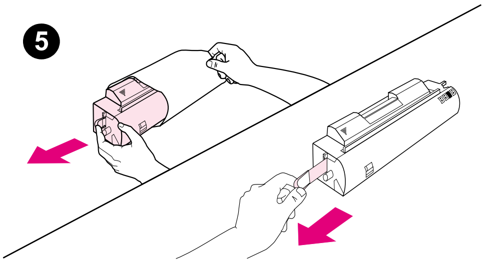
If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

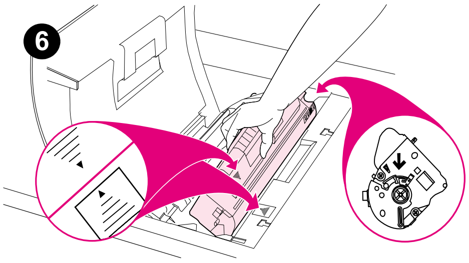










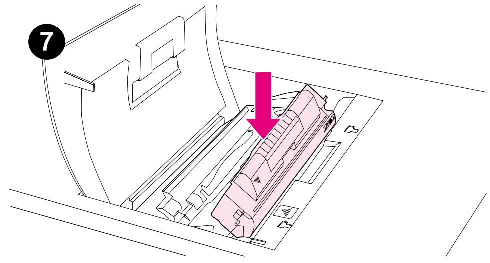


Installing the toner cartridges—for newer version HP Color LaserJet 4500 and HP Color LaserJet 4550 printers

Note

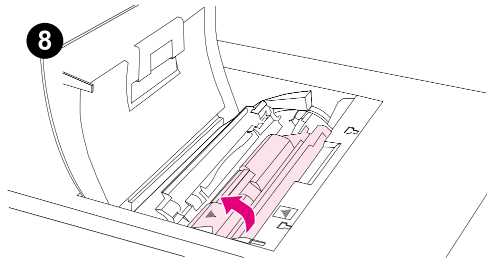
The following instructions are for newer versions of the 4500 series and 4550 series printers (see page 140 to determine which version of the printer you have). See page 51 for instructions for installing toner cartridges in older version printers.

1. Locate the toner cartridges packaged in the printer box. The printer uses four different toner colors and has a different toner cartridge for each color:
   C = black; M = magenta; C = cyan; and Y = yellow.
2. If the printer is not already turned on, turn it on and close all doors and drawers. After the printer warms up for a few minutes, the control panel displays: `TONER POSITION BLACK = MISSING`.
3. Push the dark gray release button on the left side of the printer ([1]) and open the printer's top cover ([2]).
4. The cartridge slot for the black toner cartridge is visible. Lift up the flap that partially covers the cartridge slot.
5. Remove the black toner cartridge from the bag and locate the orange tab on the end of the toner cartridge. Pull the tab firmly to remove the inside sealing tape. (If the tab breaks off, pull on the tape.) Discard the tape.
6. Position the toner cartridge over the cartridge slot so that the blue arrow on the toner cartridge points to the blue arrow on the printer. The arrow on the right (control panel side of the printer) should point straight down.

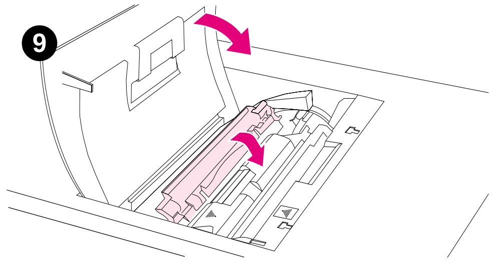


7 Slide the toner cartridge down into the slot until the cartridge stops.

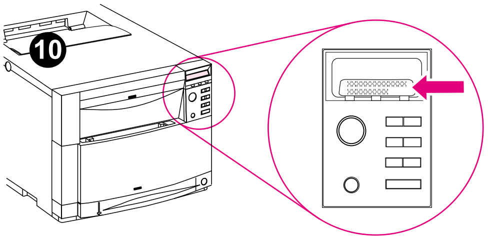
Note
If the cartridge does not slide easily into the slot, ensure that you have the right color cartridge for that slot.



8 Rotate the toner cartridge toward the back of the printer (within the cartridge slot) until the cartridge clicks in place.



9 Lower the flap to partially cover the toner cartridge. If the cartridge was rotated correctly, the flap covers the cartridge label. Close the top cover before installing the next toner cartridge.



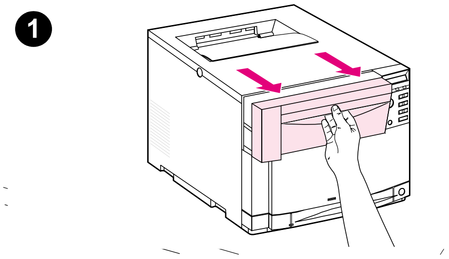
10 When the top cover is shut, the carousel advances to the next toner cartridge slot. When the printer is ready, the control panel displays:

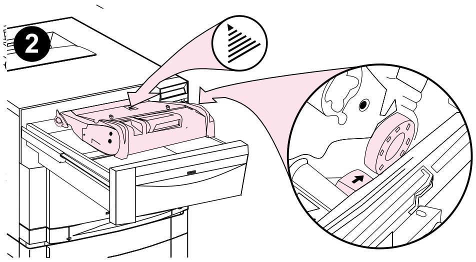
```
TONER POSITION
<COLOR> = MISSING
```

Install the other three toner cartridges by repeating steps 3 through 9.

11 After installing the fourth toner cartridge, close the top cover and press [Go]. Wait while the printer runs an internal color calibration. The calibration takes a few minutes. When the printer is ready, the control panel displays: `READY`.

❶





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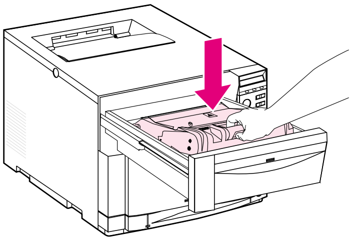

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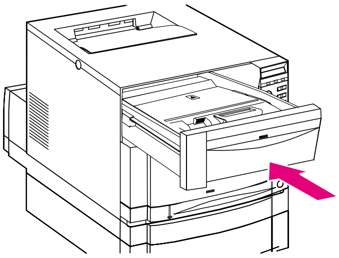


Installing the imaging drum

CAUTION

Avoid exposing the imaging drum to direct light. Exposure to light for more than 15 seconds can seriously damage the imaging drum.

---

1 Pull open the drum drawer until it stops.

2 Align the imaging drum over the drawer so that the arrow on top points to the rear of the printer, and the blue end cap on the side slides into the slot identified with the blue arrow.

3 Slide the imaging drum down into place.

4 Push the front upper drawer shut. Wait while the printer runs an internal color calibration. The calibration takes a few minutes. When the printer is ready, the control panel displays `READY`.

CAUTION

If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

Using the parallel cable

The printer can connect to the computer with a bidirectional parallel cable (IEEE-1284C compliant) (see Figure 3-2). Connect the male “C” connector to the printer and the male “B” connector to the computer. HP recommends that the parallel cable length be no longer than 10 meters (30 ft) in length. The cable (HP part number C2946A) is included with the HP Color LaserJet 4500 printer and the 4550 printer. It must be purchased separately for the HP Color LaserJet 4500N, 4500DN, 4550N, 4550DN and 4550HDN printers.

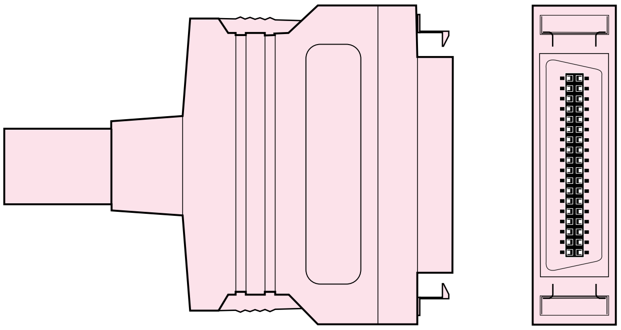


Figure 3-2 Parallel cable with a “C” connector

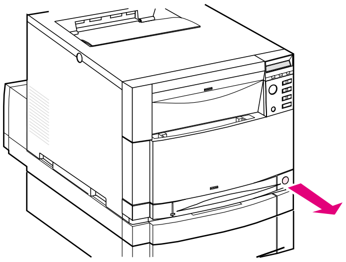
Parallel interface

When used to describe a parallel interface, the term *bidirectional* indicates that the printer is able to both receive data from the computer and send data to the computer through the parallel port.

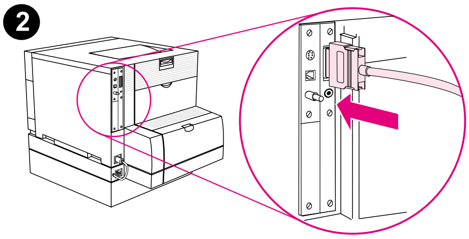
Note To use the enhanced capabilities of the bidirectional parallel interface such as bidirectional communication between the computer and printer, faster transfer of data, and automatic configuration of printer drivers, your software application must support these capabilities.

When you are using multiple ports, you can adjust automatic I/O switching to maximize performance by using the timeout feature. If data from other ports appears in the middle of your print job, increase the I/O timeout value.

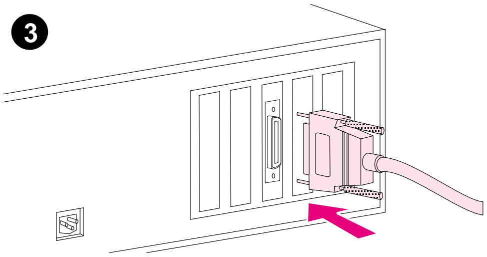
1



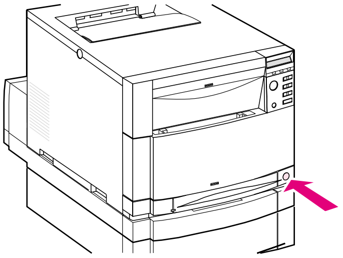
2



3



4



Connecting a parallel cable

1 Press the printer standby button (power switch) to place the printer in standby mode. Turn off the computer.

2 Plug the parallel cable into the printer’s parallel port until it snaps into place.

3 Plug the other end of the parallel cable into the computer. Tighten the screws on the parallel cable to secure the cable to the computer.

4 Turn the computer on and then turn the printer on.

Note

Your system will sense the printer (if your system is Plug and Play compatible). Follow the directions on your screen. To install the complete software package, cancel Plug and Play, and see the getting started guide for more information.

Parallel cable pin configuration

To take advantage of the enhanced bidirectional parallel interface, use a 10-meter (30 ft.) parallel cable (IEEE-1284 compliant) with a 25-pin DB male to a (IEEE-1284C) male “C” connector. Use the following table to verify correct pin configuration.

Signal Name	Printer Pin #	Computer Port #
nSTROBE	15	1
DATA 0	6	2
DATA 1	7	3
DATA 2	8	4
DATA 3	9	5
DATA 4	10	6
DATA 5	11	7
DATA 6	12	8
DATA 7	13	9
nACKNLG	3	10
BUSY	1	11
CALL (PE)	5	12
SELECT	2	13
NAutoFd	17	14
O VDC (GND)	19 – 35	18 – 25
nFAULT	4	15
nSe/In	16	17
nINIT	14	16
PERIPHLH	36	
N.C.	18	

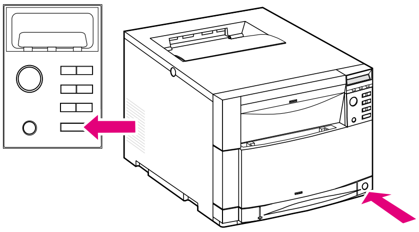
Selecting the display language

To change the display language on the printer control panel, do the following:

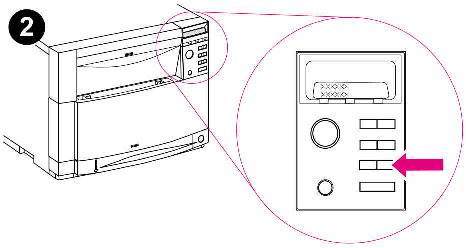
1. Press and hold [SELECT] on the printer control panel while pressing the standby button (power switch). Continue holding [SELECT] until the control panel displays `SELECT LANGUAGE` (in English), and then release the [SELECT] key.
2. When the control panel displays `LANGUAGE=ENGLISH *`, press [VALUE] repeatedly until your language choice appears.
3. Press [SELECT] to save your language choice. An asterisk appears next to the selected language. Then press [GO].
4. After the printer warms up, the control panel displays `READY` in the selected language. See Table 7-2 on page 217 if an error message appears.

Note
If the control panel does not display the message in the language you selected, press the printer standby button and repeat the instructions for changing the display language.

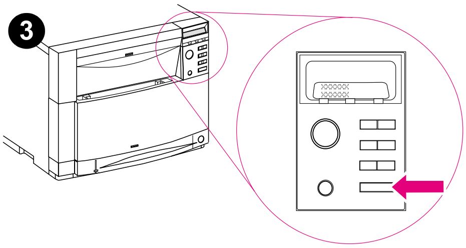
❶



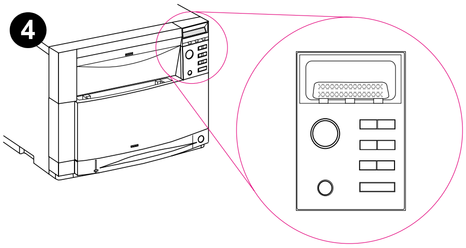
❷



❸



❹

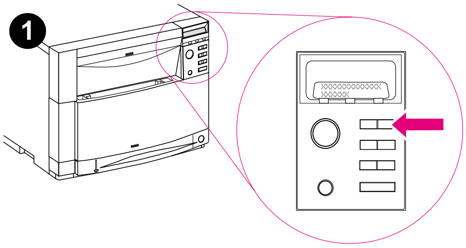


Testing the printer operation

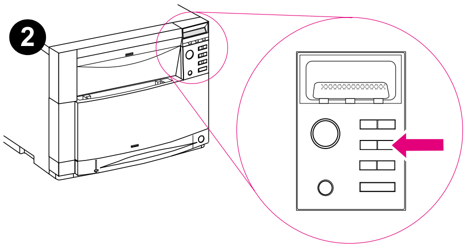
Print a configuration page to ensure that the printer is working properly.

1. On the control panel, press [MENU] until `INFORMATION MENU` appears on the display.
2. Press [ITEM] until `PRINT CONFIGURATION` appears.
3. Press [SELECT] to print a configuration page.
4. After about 30 seconds, the configuration page prints. If it does not print, see the “Troubleshooting flowchart” on page 213.

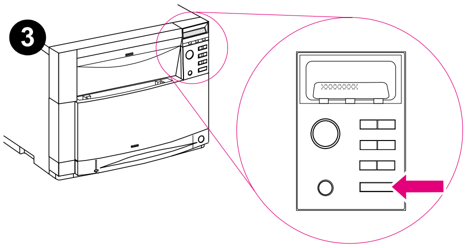
❶



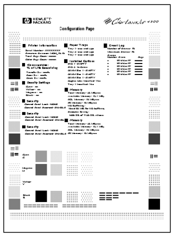
❷



❸

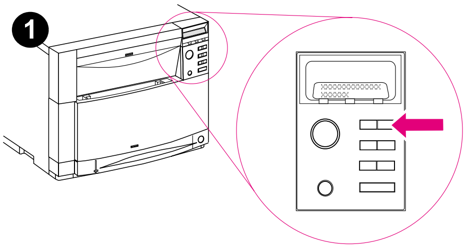


❹

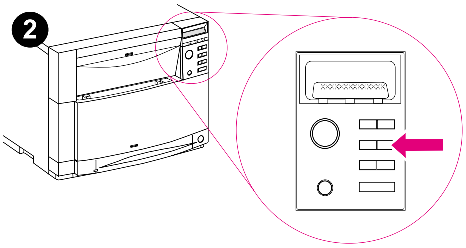


Using PowerSave

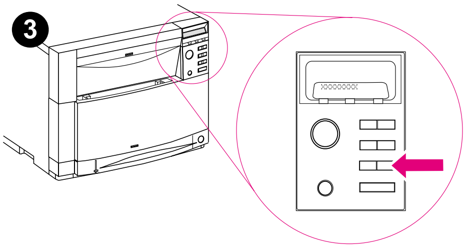
PowerSave reduces power consumption when the printer is not in use. The factory default setting for PowerSave is ON, and the time setting is one hour. The instructions below explain how to change the time setting and how to turn PowerSave OFF.



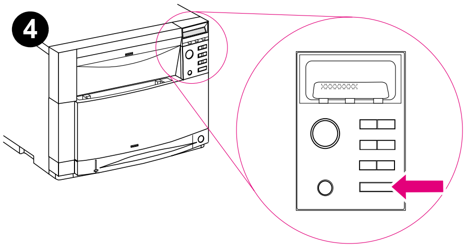
1 On the control panel, press [MENU] until CONFIGURATION MENU appears on the control panel display.



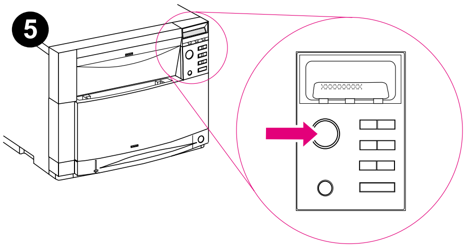
2 Press [ITEM] until POWERSAVE=1 HR * appears on the HP Color LaserJet 4500, or POWERSAVE=30 MIN * appears on the HP Color LaserJet 4550.



3 Press [VALUE +] or [VALUE –] to display other time-setting choices between 1 minute and 8 hours for the HP Color LaserJet 4500, or turning PowerSave off. Time choices are between 1 minute and 4 hours for the HP Color LaserJet 4550; see the Resets Menu to turn PowerSave off.

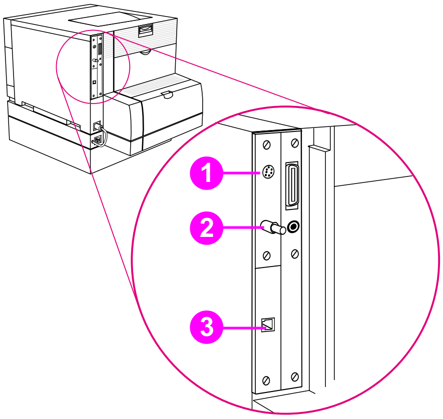


4 Press [SELECT] to save your choice. An asterisk (*) appears beside your saved choice.



5 Press [GO]. The control panel displays READY.

Connecting to a network



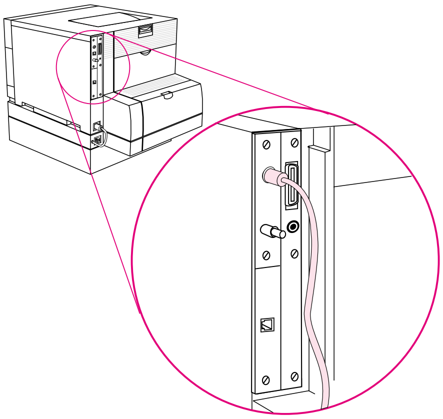
Network cable connection

The following ports are available on the HP JetDirect print servers:

1. LocalTalk DIN-8 port (not available on the HP JetDirect J3113A print server)
2. BNC port for ThinLAN coaxial cable (not available on the HP JetDirect J3113A print server
3. RJ-45 port

Note
On the HP JetDirect J3113A print server, you can attach either a ThinLAN cable or a 10Base-T cable, but not both at the same time.

See the instructions that follow to connect one or more network cables to the printer.



LocalTalk DIN-8 connection

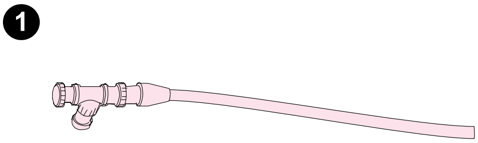
Connecting to a LocalTalk network (J3111A only)

Plug the end of your DIN-8 cable into the LocalTalk port on the HP JetDirect print server. Attach the other end to the network.

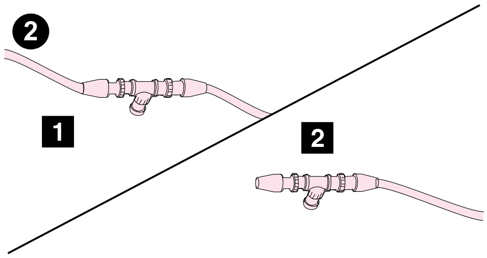
Note
Network cables are not included with the printer. They must be purchased separately.

Connecting to a 10Base2 network (J3111A only)

1 Attach one section of your ThinLAN cable to the BNC “T” connector.

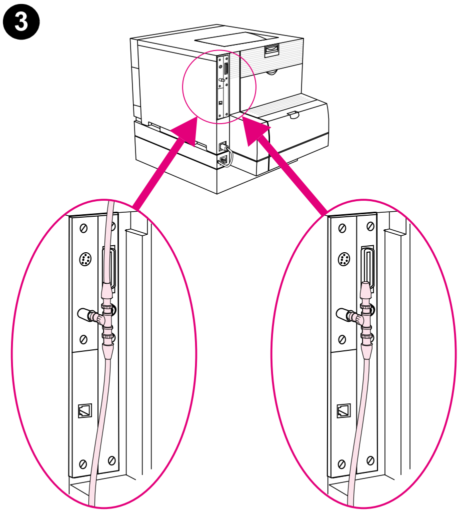


2 Attach another ThinLAN cable section ([1]) or a 50-ohm terminator ([2]) to the other side of the BNC “T” connector. If you are attaching the printer to the end of your network, you must connect a 50-ohm terminator.)



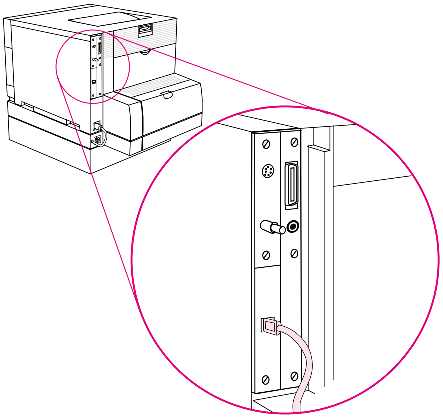
Note
The BNC “T” connector and 50-ohm terminator for the 10Base-2 connection are not included with the printer. They must be purchased separately.

3 Connect the BNC “T” connector to the BNC port on the HP JetDirect print server.



BNC port

Note
The HP JetDirect J3111A print server supports one Ethernet cable connection at a time.

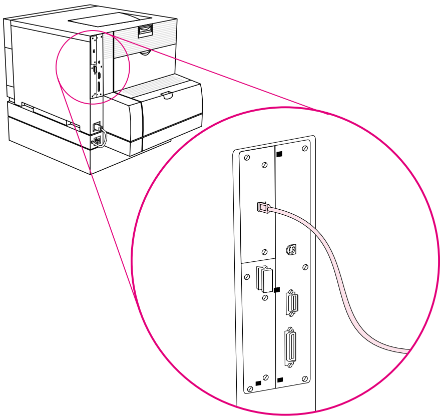


HP Color LaserJet 4500 RJ-45 (10Base-T or 10/100Base-TX) connection

Connecting to a 10Base-T or 10/100Base-TX network

Plug the connector of your unshielded twisted-pair cable into the RJ-45 port. The other end of the cable should be attached to the network.

Note
The HP JetDirect print server supports one Ethernet cable connection at a time.



HP Color LaserJet 4550 RJ-45 (10Base-T or 10/100Base-TX) connection

Plug the connector of your unshielded twisted-pair cable into the RJ-45 port. The other end of the cable should be attached to the network.

Note
The HP JetDirect Print server supports RJ-45 connection to 10Base-T or 10/100Base-TX and Fast Infrared (FIR) and parallel ports.

Enhanced I/O (EIO) configuration

This printer comes equipped with two enhanced input/output (EIO) slots. These slots hold compatible external devices such as the HP JetDirect 600N Print Server. Plugging EIO cards into the slots increases the number of network interfaces available to the printer.

EIO cards can maximize printer performance when you are printing from a network. In addition, they provide the ability to place the printer anywhere on a network. This eliminates the need to attach the printer directly to a server or a workstation and enables you to place the printer closer to your network users.

The printer control panel will have an additional menu (EIO Menu) if the printer is configured with EIO cards. (See the chapter on using the printer control panel in the online user guide.)

Note Installation of cards and network configuration should be performed by a network administrator.

Note The HP Color LaserJet 4550 series printer supports the optional 5 GB hard disk drive (included with the HP Color LaserJet 4550HDN printer). The HP Color LaserJet 4500 series printer does not support an optional hard disk drive.

HP JetDirect print servers

HP JetDirect print servers (network cards) can be installed in one of the printer EIO slots. These cards support multiple network protocols and operating systems. HP JetDirect print servers facilitate network management by allowing you to connect a printer directly to your network at any location. HP JetDirect print servers also support the Simple Network Management Protocol (SNMP), which provides network managers with remote printer management and troubleshooting through HP Web JetAdmin software.

LocalTalk I/O

The LocalTalk interface enables you to print directly from a stand-alone Apple Macintosh computer or from a Macintosh computer on a LocalTalk network. For specific information about configuring your computer and printer to print through a LocalTalk interface, refer to the printer's getting started guide and the *HP JetDirect Print Server Software Installation Guide.*

CPU

The HP Color LaserJet 4500 formatter PCB incorporates a 133-MHz RISC processor.

The HP Color LaserJet 4550 formatter PCB incorporates a 200-MHz RISC processor.

Fast InfraRed Receiver (optional)

The HP Fast InfraRed Receiver enables cableless printing from any IrDA-compliant portable device (such as a laptop computer) to the HP Color LaserJet 4550 printer (when the optional FIR accessory is installed).

The printing connection is maintained by positioning the sending FIR port within operating range. Note that the connection can be blocked by objects such as a hand, paper, direct sunlight, or any bright light shining into either the sending or receiving FIR port.

System requirements

In order to print with the HP Fast InfraRed Receiver, you will need:

- the receiver connected to this printer
- IrDA-compliant portable or other IR-capable host supporting IRLPT or JetSend Communications Technology over IR
- Microsoft Windows 9x, Windows NT 4.0, Windows 2000 or Mac 8.5 with a LaserWriter 8.6 or higher driver

Note Older non-IrDA-compliant portable computers might not be compatible with the HP Fast InfraRed Receiver. If you experience problems when attempting to print with the HP Fast InfraRed Receiver, contact the manufacturer of or dealer for your portable computer to verify compatibility with the IrDA standard.

For more information, see the *HP Fast InfraRed Receiver User Guide* that came with the HP Fast InfraRed Receiver.

Printer drivers

The optimal way to control the printer is through settings in a software application or through the printer driver. Changing print settings via a software application affects only that particular print job. Most software applications allow you to choose print settings from menus within the application. Software application settings and printer driver settings override the settings on the printer control panel.

For best print quality, always select the paper or media type in the printer driver. Different media types use different printer settings. For example, selecting transparencies in the driver causes the printer to use a different color table, one designed for maximum print quality on transparencies. Additionally, transparencies cause the printer to adjust printer speed and fuser temperature.

Other media types affect the printer settings as well: Selecting heavy or glossy media, for example, causes the printer to change the engine speed.

The printer driver also gives you customized control of color text, graphics, and photos. The following color control features are available only through your HP printer driver:

- Halftone Options
- HP ColorSmart II

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photos independently. The two halftone options are Smooth and Details.

HP ColorSmart II default settings will produce optimum results for most color printing needs. However, you can also manually adjust color settings through the printer driver’s Vivid Color and Screen Match color control options.

See the printer driver’s online Help for details on color settings and their effect on printed output.

Network configuration

Configuring the printer for the network

You can configure certain network parameters on the printer from the printer control panel or, for most networks, from the HP JetAdmin Software (or the HP LaserJet Utility for Macintosh). The utilities are provided on the printing software CD-ROM that comes with the printer. You can also set these parameters from the HP Web JetAdmin Software, which is available at http://www.hp.com/go/webjetadmin.

For a complete list of supported networks and for instructions on configuring network parameters from software such as HP JetAdmin and HP Web JetAdmin, see the *HP JetDirect Print Server Software Installation Guide*. The guide comes on the CD-ROM with printers in which an HP JetDirect 600N print server is installed.

Note If you are configuring network parameters from the printer control panel, the control panel menu appears in the languages listed below. If your language is not listed, the menu will appear in English and you will need to configure the printer by using HP JetAdmin software (or the HP LaserJet Utility for Macintosh).

DanishFrenchPortuguese
DutchGermanSpanish
EnglishItalianSwedish
FinnishNorwegian

Configuring Novell NetWare frame type parameters

The HP JetDirect 600N print server automatically selects a NetWare frame type. Select a frame type manually only when the print server selects an incorrect frame type. To identify the frame type chosen by the HP JetDirect 600N print server, print a configuration page.

Configuration tips

HP JetDirect 600N print servers (network cards) provide software solutions for:

- Novell NetWare versions 3.x and 4.x
- Microsoft Windows 3.1 and Windows 95
- Microsoft Windows NT 3.51 and 4.0
- IBM OS/2 LAN Server or Warp Server
- LocalTalk
- UNIX (HP-UX, Solaris, and SunOS)

For information about installing HP JetDirect 600N print servers and the types of interfaces and network operating systems supported, see the *HP JetDirect Print Server Software Installation Guide*.

NetWare 3.x and 4.x based products

When using Novell NetWare 3.x and 4.x products with the HP JetDirect print server, queue server mode provides improved printing performance over remote printer mode. For more information, see the *HP JetDirect Print Server Software Installation Guide*.

Windows 3.1, Windows 95, and Windows NT 3.51 and 4.0 networks

For Windows 3.1 and Windows 95 networks, HP JetAdmin software works as a Windows application and supports native Novell Directory Services (NDS).

For peer-to-peer Windows 95 networks, HP JetAdmin software works as a Windows application, and connects HP printers to an IPX/SPX-compatible printer network using an HP JetDirect print server.

For Windows NT 3.51 and 4.0 networks, HP JetAdmin software supports the TCP/IP or IPX/SPX environments.

IBM OS/2 LAN Server and Warp Server networks

For IBM OS/2 LAN Server and Warp Server Networks, HP JetAdmin software supports the Data Link Control (DLC) environment. Depending on the number of network printers and type of printer driver, when using virtual memory, improved performance might be realized by increasing server RAM, especially if the swapper.dat file is large.

LocalTalk network

The LocalTalk interface enables you to print directly from a stand-alone Apple Macintosh computer or from a Macintosh computer on a LocalTalk network. For specific information about configuring your computer and printer to print through a LocalTalk interface, refer to the printer’s getting started guide and the *HP JetDirect Print Server Software Installation Guide*.

Macintosh DIN-8 cable

To connect a Macintosh computer directly to this printer, use a standard Macintosh DIN-8 printer cable. This cable cannot be used in a network configuration.

Note For LocalTalk configuration, the DIN-8 printer cable must be plugged into the printer port of your Macintosh computer.

LocalTalk configuration

To connect the printer to a Macintosh computer on a LocalTalk network, use the HP LocalTalk Cable Kit. You will need a kit for each printer and an additional kit for each Macintosh computer on your network.

UNIX networks

HP JetAdmin software provides a TCP/IP-based solution for configuring and managing HP JetDirect print servers on HP-UX, Solaris, and SunOS systems.

Setting network security on the printer

This printer features control panel locking, which allows network administrators to prevent users from changing certain printer control panel settings. When a menu is locked, unauthorized users trying to change settings in the printer control panel will receive the following message:

ACCESS DENIED
MENUS LOCKED

You can use HP JetAdmin software, the HP LaserJet Utility for Macintosh, or an ASCII escape sequence to perform this procedure. For instructions on locking the printer control panel using either the HP JetAdmin software or the HP LaserJet Utility for Macintosh, see the online Help for these utilities.

Locking the control panel

You can prevent users from changing printer control panel settings by establishing a password and locking the printer control panel. The control panel offers multiple levels of security. You can lock certain control panel menus, allowing users to change the rest of the menus, or you can lock all of the menus—and you can even lock the [CANCEL JOB] key. When the printer control panel is locked, unauthorized users who try to change settings at the control panel receive the following message:

```
ACCESS DENIED
MENUS LOCKED
```

Levels of security

Table 3-1 Printer security levels

Lock setting	Control panel items locked	
0 = None	No items are locked	
1 = Minimum	Configuration Menu I/O Menu	Calibration Menu Resets Menu
2 = Moderate	Configuration Menu I/O Menu Calibration Menu	Resets Menu Paper Handling Menu
3 = Maximum	Configuration Menu I/O Menu Calibration Menu Resets Menu	Paper Handling Menu Information Menu Printing Menu [CANCEL JOB] key

Use HP JetAdmin software, HP LaserJet Utility for Macintosh, or an ASCII escape sequence to perform this procedure. HP software, which comes on the software CD-ROM, is easier to use than an ASCII escape sequence. For instructions about locking the control panel by using either HP JetAdmin software or the HP LaserJet Utility for Macintosh, go to the online Help for that software.

Using an ASCII PJL escape sequence to set network security

If you decide to use the ASCII escape sequence, you must use an MS-DOS® or Windows ASCII editor to create the commands. The commands must also be sent to the printer by using a DOS COPY command or an ASCII file download utility. The *PJL Technical Reference Manual* is located on CD-ROM, part number 5961-0976. Order a copy of this manual from the HP website: http://www.hp.com.

Note In the following examples, EC represents the escape character. For more information on using escape characters, see the *PJL Technical Reference Manual*.

- To lock or unlock the printer control panel if a password has not been set, send the following ASCII sequence to the printer:

```
EC%-12345X@PJL JOB
@PJL DEFAULT CPLOCK=NONE
   (or MINIMUM, MODERATE, or MAXIMUM)
@PJL EOJ
EC%-12345X
```

- To set the password, send the following ASCII sequence to the printer:

```
EC%-12345X@PJL JOB
@PJL DEFAULT PASSWORD=[numeric password (0 to 65535)]
@PJL EOJ
EC%-12345X
```

- To lock or unlock the control panel if the password has been set, send the following ASCII sequence to the printer:

```
EC%-12345X@PJL JOB PASSWORD=(numeric password)
@PJL DEFAULT CPLOCK=NONE
   (or MINIMUM, MODERATE, or MAXIMUM)
@PJL EOJ
EC%-12345X
```

4 Printer maintenance

Chapter contents

Cleaning the printer and accessories 78
  Cleaning spilled toner 78
Approximate replacement intervals for consumable items 80
  Imaging drum life 80
  Replacement intervals for consumables 83
Locating consumables 84
Replacing consumable items 85
  Cleaning the toner density sensor 85
  Replacing the toner cartridges 86
  Replacing the imaging drum 88
  Replacing the transfer kit 89
  Replacing the fuser kit 92
  Replacing the paper rollers 94
DIMM configuration 98
  Adding memory 98

Cleaning the printer and accessories

To maintain high print quality and performance, use the following opportunities to thoroughly clean the printer and the paper handling accessories:

- every time you change the toner cartridge (run a few pages through)
- after printing approximately 5,000 pages for C (cyan), M (magenta), and Y (yellow); and 8,000 pages for K (black)
- whenever print quality problems occur

Clean the outside surfaces with a water-dampened cloth. Observe the warning and caution below.

WARNING! Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard.

Be careful when cleaning around the fusing assembly area. It might be hot.

CAUTION To avoid permanent damage to the toner cartridge, do not use ammonia-based cleaners on or around the printer.

Do not touch the transfer roller. Skin oils on the roller can reduce print quality. If toner gets on your clothes, wipe it off with a dry cloth and wash your clothes in cold water. Hot water sets toner into fabric.

Table 4-1 Cleaning the printer

Component	Cleaning Method
Outside covers	Use an HP Toner Cleaning Cloth (part number 5090-3379) or a water-dampened cloth. Do not use solvents or ammonia-based cleaners.
Inside general	With a dry lint-free cloth, wipe any dust, spilled toner, and paper particles from the paper path area, the registration roller, and the toner cartridge cavity.
Paper pickup, feed, and separation rollers	Use a water-dampened, lint-free cloth.
Separation pad	Use a dry, lint-free cloth.
Registration roller	Use a dry, lint-free cloth.
Transfer roller	Use a dry, lint-free cloth. DO NOT TOUCH the transfer roller with your fingers.
Fuser	Use a water-dampened, lint-free cloth.

Cleaning spilled toner

Defective toner cartridges can develop leaks. Also, after a paper jam has occurred, some toner might remain on the rollers and guides inside the printer. The pages that print immediately after the jam can pick up this toner.

CAUTION When cleaning the printer, do not touch the transfer roller with the damp cloth or with your fingers.

Vacuum specifications

Do not vacuum the printer or any spilled toner using a conventional vacuum. Toner particles used in this product might be too fine for effective vacuuming and could result in damage to conventional vacuums.

A vacuum specifically designed for cleaning toner can be used if it is capable of filtering fine particles (5 microns in diameter).

Toner catch tray and transport assembly

Thoroughly clean the toner catch tray, and clean or replace the paper transport assembly. These assemblies are easily accessed once the fusing assembly has been removed (see “Toner catch tray and paper transport assembly” on page 204).

To remove the toner catch tray, pull downward on the tab and slide the tray out of the rear of the printer. To remove the transport assembly, remove the one screw (shown in Figure 6-69 on page 204) and then slide the assembly to the left. Once the assembly is free of the spline gear drive, you can easily maneuver the assembly out of the rear of the printer. Thoroughly vacuum the assembly and the cavity where the transport assembly rests.

When re-installing the transport assembly, there are two tabs on the right side of the assembly that must be aligned to the printer’s frame; the white drive gear splines on the assembly must be aligned with the driving gear mechanism on the printer.

Approximate replacement intervals for consumable items

Imaging drum life

Images versus pages

The life of the imaging drum (about 25,000 pages) is stated in terms of A-4/Letter-size images. The number of images printed for each sheet of paper varies, depending on the mix of color, type of format, and whether duplexing has occurred. The following guidelines will help determine drum life:

- An “image” is a layer of toner. An A-4/Letter-size color page printed on one side contains four A-4/Letter images, one for each color (CMYK).
- A duplexed sheet counts as two pages. In color duplex mode (printing on both sides of a page), there are eight A-4/Letter-size images per A-4/Letter sheet.
- The page count numbers on the Configuration Page give a count of the number of pages printed, regardless of size. For example, an A-4-size color duplexed page takes eight images to print, but only adds two pages to the page count.

Usage patterns

How the printer is actually used can also have a significant effect on drum life:

- Because of pre- and post-rotations, the drum wear is approximately the same for a one-page job as for a two-page job. Frequent short jobs will decrease the drum life.
- There are extra rotations and cleaning cycles when printing duplex pages. Duplex jobs use the imaging drum at a higher rate than comparable simplex jobs.

“Drum life low” versus “drum life out”

The `DRUM LIFE LOW` warning message on the control panel indicates approximately 20 percent of life remaining. This is intentional to allow the user enough time to order a replacement kit (C4195A). It is perfectly acceptable to continue to print while the `DRUM LIFE LOW` message is displayed. However, when the `DRUM LIFE OUT` message occurs, the drum has reached the end of its life and the printer will not operate.

Key points to remember

- The drum life specification assumes two-page jobs, one-sided printing on A-4/Letter-size pages. When printing in color (four images per page), the number of pages will be 1/4 of the images printed.
- Due to the carousel arrangement of the color cartridges, color printing uses four images per page even if only one color is actually used.

Drum life under different circumstances

The following graph shows the approximate life of the imaging drum for different types and sizes of print jobs.

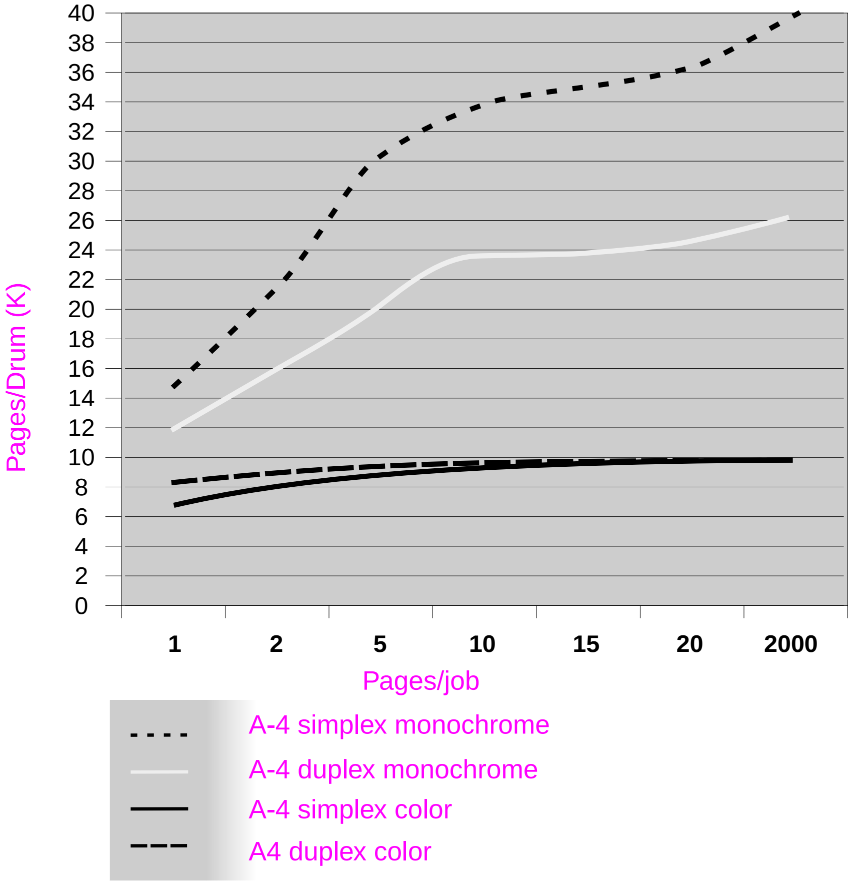


Figure 4-1 **Imaging drum life**

Note When printing black pages, there is a wider range of variation in pages/drum. The drum life will be well below 25,000 images if only short monochrome jobs are printed.

The following graph shows the drum life for printing in Letter and Legal formats:

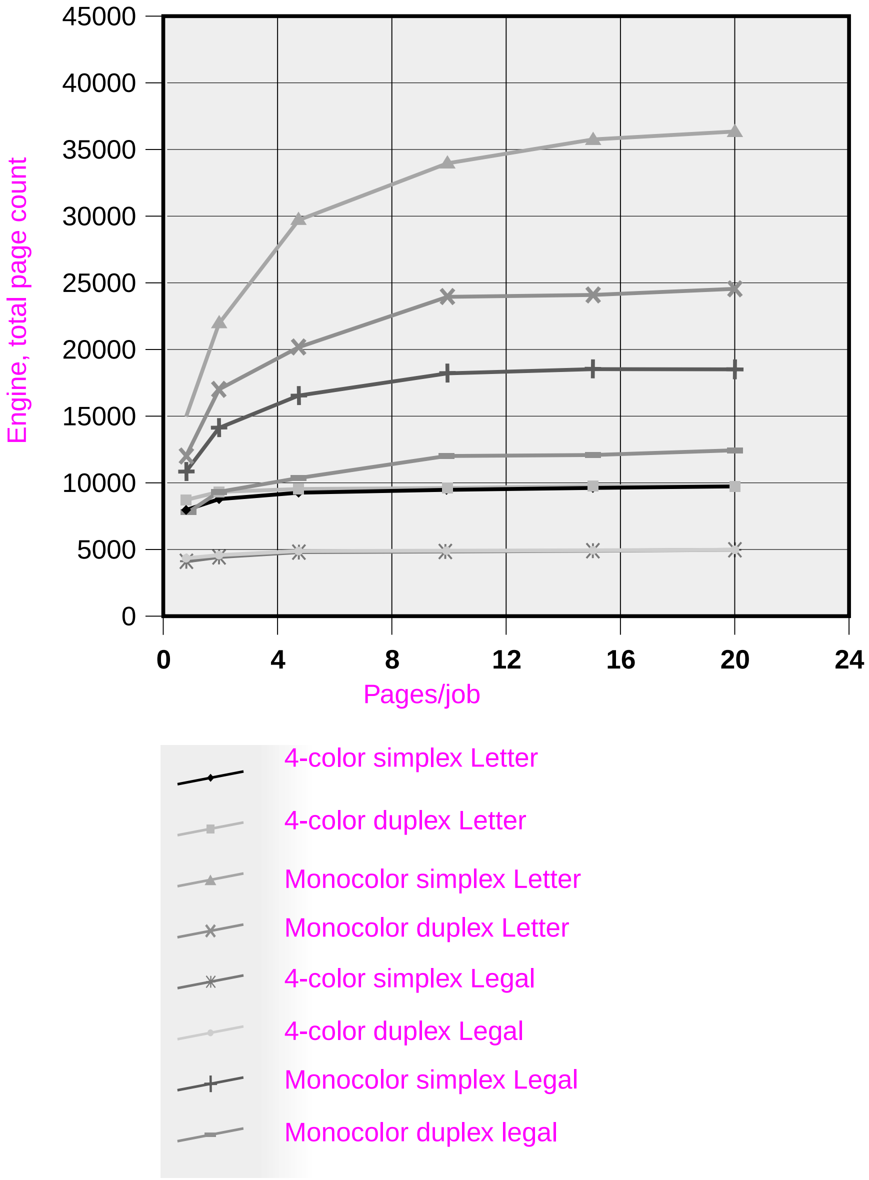


Figure 4-2 **OPC life**

Replacement intervals for consumables

You can identify consumable items by their labeling and their blue plastic handles. For instructions on installing consumables, see the installation guides supplied with each consumable item.

The following table lists the replacement intervals and part numbers for printer consumable items, and the control panel messages that prompt you when it is time to replace each item.

Table 4-2 Approximate replacement interval for consumable items

Consumable	Printer message	Page count	Approximate time period[1]	Part number
Black (K) toner cartridge	`TONER K LOW` or `TONER K OUT`	9,000 pages [2]	4.5 months	R94-4005-410CN (see Table 8-1)
Cyan (C) toner cartridge	`TONER C LOW` or `TONER C OUT`	6,000 pages [2]	3 months	R94-4004-410CN (see Table 8-1)
Magenta (M) toner cartridge	`TONER M LOW` or `TONER M OUT`	6,000 pages [2]	3 months	R94-4003-410CN (see Table 8-1)
Yellow (Y) toner cartridge	`TONER Y LOW` or `TONER Y OUT`	6,000 pages [2]	3 months	R94-4002-410CN (see Table 8-1)

Drum kit	`DRUM KIT OUT`
	`REPLACE DRUM KIT`
	`WASTE TONER FULL`
	`REPLACE KIT`
		25,000 black-and-white-only pages, or 6,250 color pages.	12.5 months for black-and-white-only pages, or 3 months for color pages.	R94-4001-410CN (see Table 8-1)

Transfer kit	`TRANSFER KIT OUT` `REPLACE KIT`	100,000 black-and-white-only pages, or 25,000 color pages.	50 months for black-and-white-only pages, or 12.5 months for color pages.	R96-5009-000CN (see Table 8-1)
Fuser kit	`FUSER KIT OUT` `REPLACE KIT`	100,000 black-and-white-only pages, or 50,000 color pages.	50 months for black-and-white-only pages, or 25 months for color pages.	R96-5007-000CN (110V) R96-5008-000CN (220V) (see Table 8-1)

[1] Approximate lives are based on 2,000 pages per month.

[2] The approximate average A4/Letter-size page count is based on 5% coverage of individual toner colors. Page counts are only estimations; usage conditions and print patterns cause results to vary.

CAUTION Hewlett-Packard recommends the use of HP products in this printer. Use of non-HP products can cause problems the require service not covered by the Hewlett-Packard warranty or service agreements.

Locating consumables

Figure 4-3 illustrates the location of each consumable item.

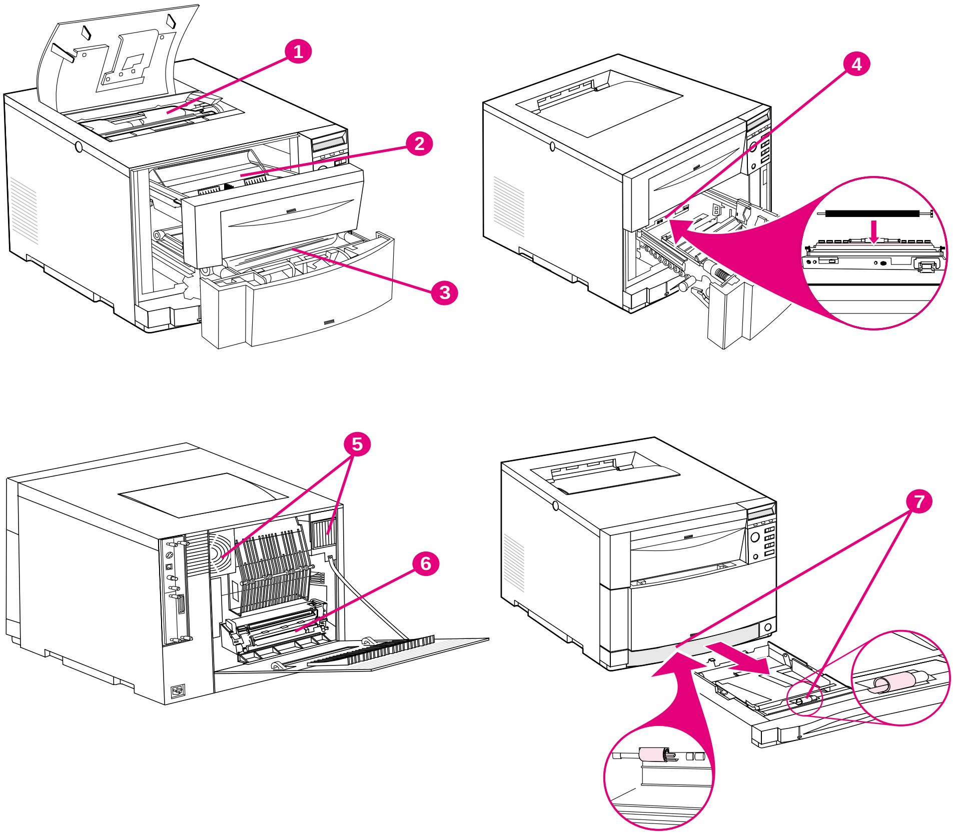


Figure 4-3 **Location of consumables**

1 Toner cartridges

2 Imaging drum cartridge

3 Intermediate transfer belt

4 Transfer roller

5 Air filters

6 Fuser

7 Paper feed and separation rollers

Cleaning the toner density sensor

Clean the toner density sensor whenever the imaging drum is replaced or when the control panel message displays: `DENSITY SENSOR OUT OF RANGE`.

CAUTION
To avoid scratching the sensor, do not clean it with any paper products.

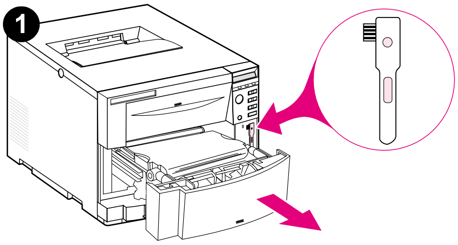
To clean the toner density sensor

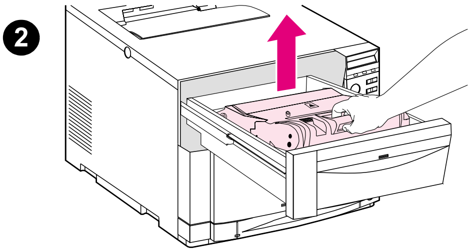
1 Open the ITB drawer and remove the cleaning brush mounted inside.

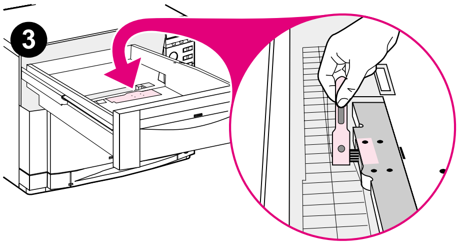
2 Open the drum drawer and remove the imaging drum using the blue handle.

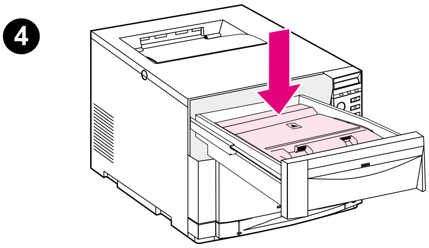
3 Using the cleaning brush, remove all dust and toner particles from the sensor as illustrated.

4 Replace the imaging drum.









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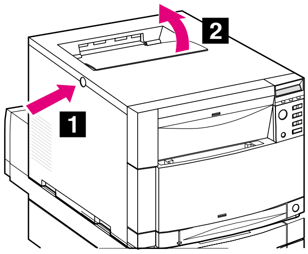

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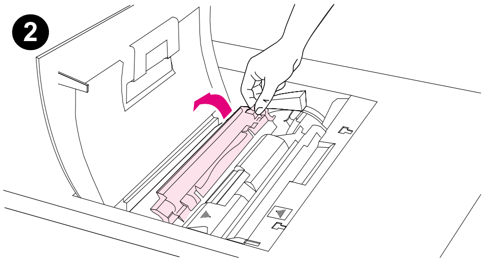

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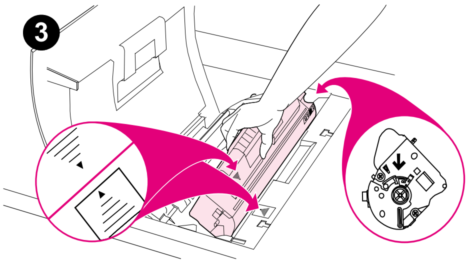


Replacing the toner cartridges

Replace the toner cartridge when the control panel displays:
`TONER CMYK OUT`.
The display can indicate that one or more toner colors are out.

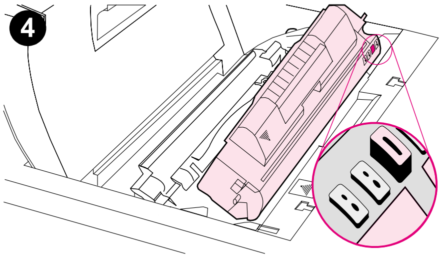
1 With the printer turned on and warmed up, push the dark gray release button on the side of the printer ([1]) and open the printer's top cover ([2]).

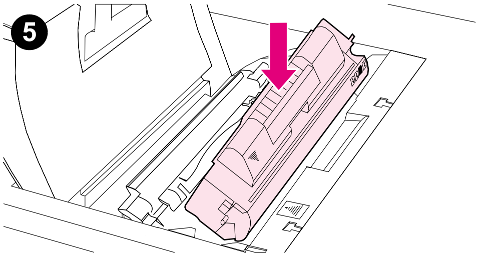
Note
If you need to replace a toner cartridge and the `TONER CMYK LOW` or `TONER CMYK OUT` messages are not displayed on the control panel, open and close the top cover. Wait for the `PRESS SELECT TO CHANGE TONER` message to appear on the control panel. Press [SELECT] and the message `TONER=<COLOR>` appears on the printer control panel. Press [–VALUE+] to select the toner cartridge you want to replace, and proceed to the following steps.

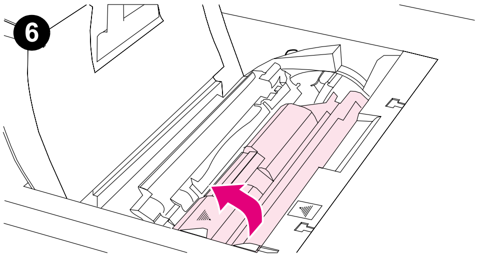
2 Lift the toner access cover and remove the used toner cartridge.

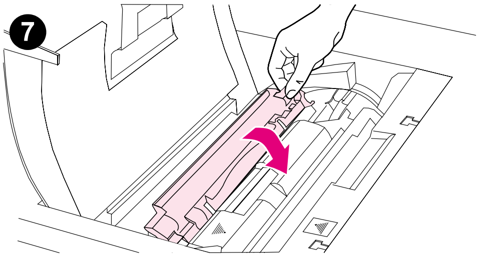
CAUTION
Do not shake the toner cartridges after removing them.

3 Position the toner cartridge over the cartridge slot so that the blue arrow on the toner cartridge points to the blue arrow on the printer. The arrow on the right (control panel side of the printer) should point straight down.









4 Make sure that the tab on the other end of the toner cartridge aligns with the notch on the cartridge slot.

Note
If the tab does not fit in the notch when you insert the toner cartridge, the toner is the wrong color for that cartridge slot.

---

5 Slide the toner cartridge down into the slot until the cartridge stops.

6 Rotate the toner cartridge toward the back of the printer (within the cartridge slot) until the cartridge stops. The cartridge shutter opens to reveal the developer sleeve.

7 Lower the toner access cover and close the printer’s top cover.

Note
You must close the top cover before installing another toner cartridge.

CAUTION
If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.

Note
If you receive a 54.2 error, see page 233 for more information.

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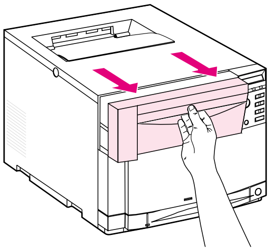

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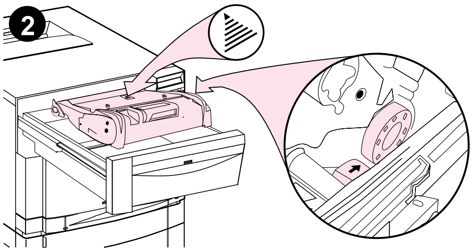

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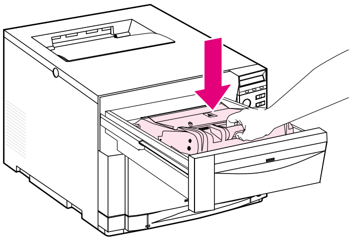


Replacing the imaging drum

Replace the imaging drum when the printer control panel displays: `REPLACE DRUM KIT`.

1. Open the drum drawer and remove the used imaging drum.
2. Locate the new imaging drum. Align it over the drawer so that the arrow on top points to the rear of the printer, and the blue end cap on the side fits into the slot identified with the blue arrow.

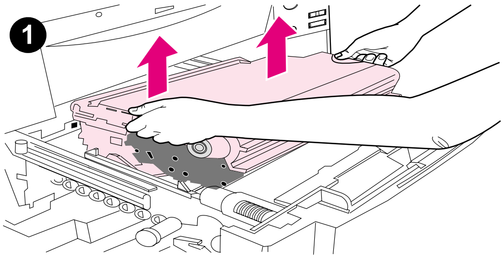
CAUTION

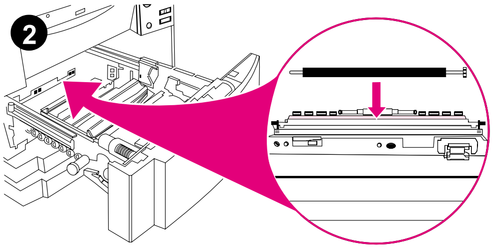
Avoid exposing the imaging drum to direct light. Exposure to light for more than 15 seconds can seriously damage the imaging drum.

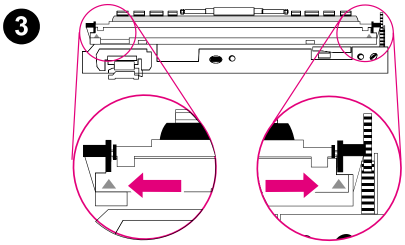
3. Slide the imaging drum down into place and close the drawer.

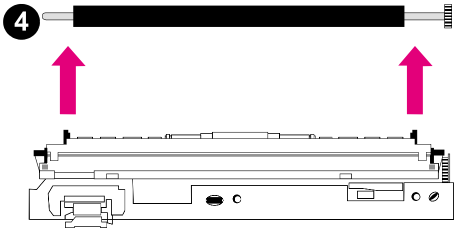
CAUTION

If you need to ship the printer, remove the toner cartridges and imaging drum before shipping.









Replacing the transfer kit

Replace the transfer kit when the printer control panel displays: `TRANSFER KIT OUT REPLACE KIT`.

The transfer kit consists of an intermediate transfer belt (ITB), a transfer roller, two air filters, and a hand wipe.

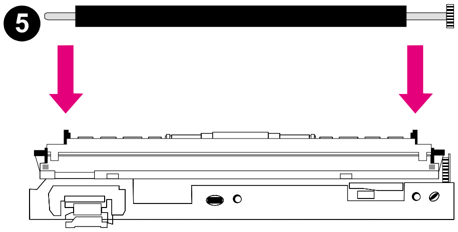
1 Open the ITB drawer. Remove the used transfer belt by pulling up on the green handles located on the sides.

2 Locate the transfer roller inside the printer.

3 To unlock the used transfer roller, gently push back and up (in a rotating motion) on the blue triangles located on the lower corners of the flap that is in front of the roller.

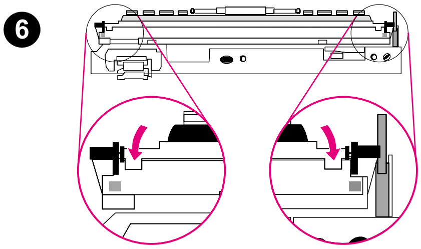
4 Remove the used transfer roller by lifting it up and then out.

CAUTION
Avoid touching the foam portion of the roller. Oil from your fingers can affect the print quality.

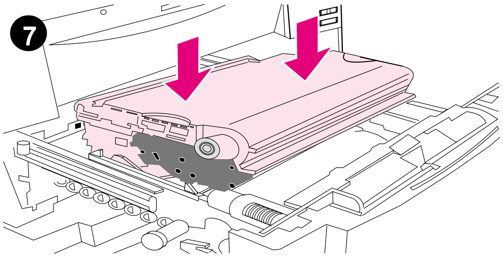


5 Locate the new transfer roller and place it in the notches behind the roller flap.

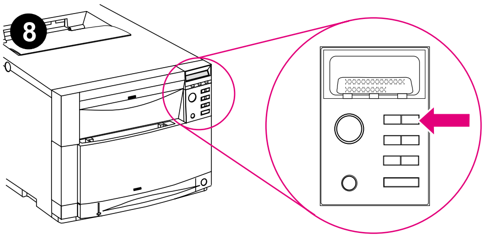
CAUTION
Be careful not to insert the transfer roller backwards. Doing so can damage the printer.



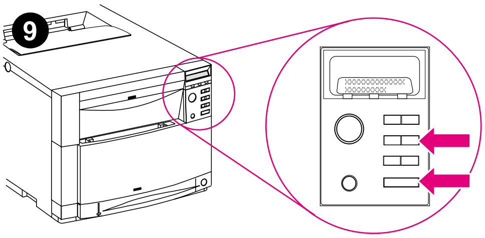
6 Snap the new transfer roller into place by pushing both ends of the roller toward the rear of the printer.



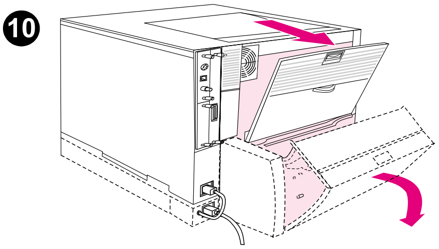
7 Remove the new transfer belt from the bag. Align the blue pins that are on both sides of the new transfer belt with the blue slots in the drawer. Then slide the transfer belt down into place. Close the ITB drawer.



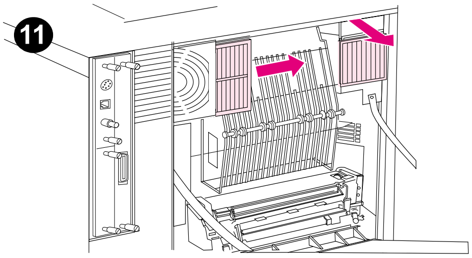
8 To reset the printer for the new transfer kit, push [MENU] on the control panel until RESETS MENU appears in the control panel display.



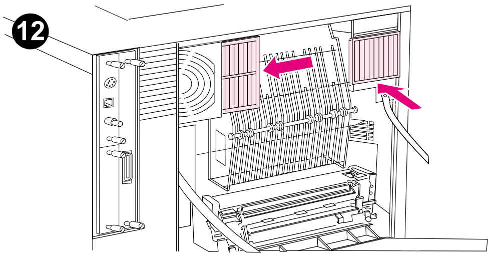
9 Press [ITEM] until `TRANSFER KIT SELECT IF DONE` appears in the control panel display. Then press [SELECT].



10 To replace the air filters, turn the printer off and wait 10 minutes for the fans to stop running. Unplug the power cord and open the upper rear door of the printer. If the printer has a duplex unit, open the rear cover of the duplex unit.



11 Remove the two used air filters from the rear of the printer. Then use the hand wipe to clean excess dust away from the fan areas.



12 Insert the new air filters. Close all doors, plug in the printer, and turn the printer on.

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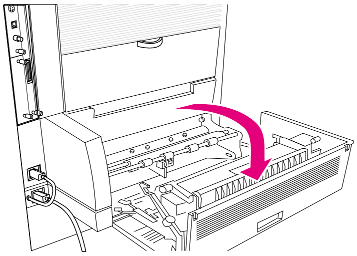

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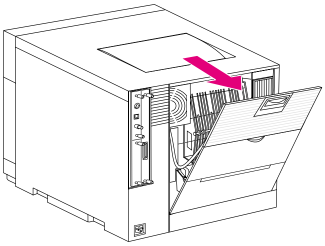

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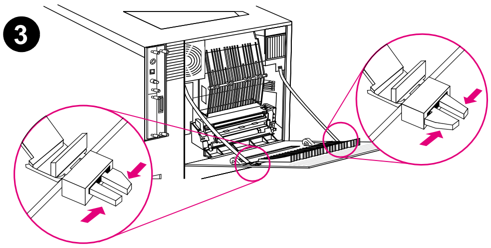

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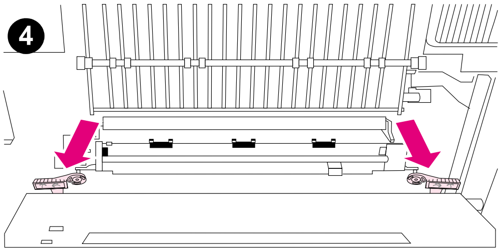


Replacing the fuser kit

Replace the fuser kit when the printer control panel displays: `FUSER LIFE OUT REPLACE KIT`.

The fuser kit contains one fuser, four paper rollers, and a hand wipe.

WARNING!

To prevent possible burns, be sure the power cord is unplugged and that the printer has cooled for 30 minutes.

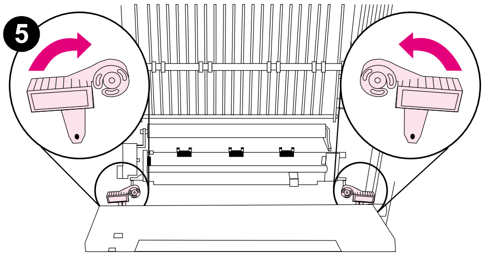
---

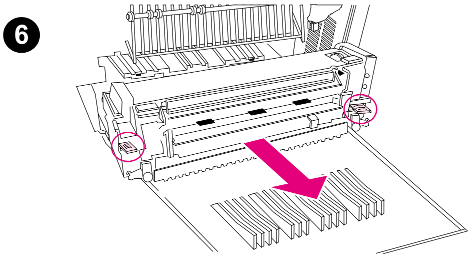
1 Open the upper-rear door of the duplex unit, if attached.

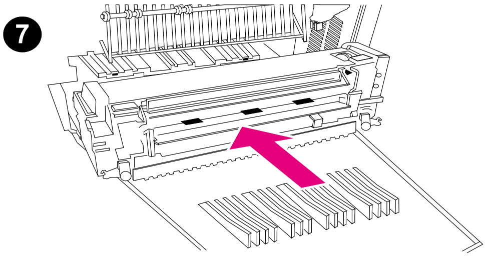
2 Open the upper-rear door of the printer.

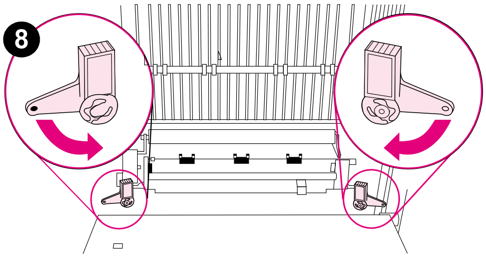
3 Release the straps from the rear door by squeezing the latches on the straps where the latches connect to the rear door.

4 Inside the back of the printer, near the bottom, locate the two blue latches on the fuser.









5 Rotate the two blue latches upward 90 degrees.

6 Grasp the finger holds on the fuser and pull the used fuser out of the printer.

7 Remove the new fuser from the bag using the finger holds. Holding the new fuser by the finger holds, slide the fuser into the printer.

CAUTION

The blue latches will lock only if the fuser is installed.

8 Lock the fuser in place by rotating the two blue latches down. Reconnect the support straps to the upper rear door.

Replacing the paper rollers

1. Remove Tray 2 from the front of the printer.
2. On Tray 2, locate the paper roller and the cover next to the roller.
3. Squeeze the cover release lever and open the cover.
4. Remove the old paper roller from Tray 2 by squeezing together the blue tabs and then sliding the roller off its spindle.

Note
The feed roller has a D-shaped hub and the separation roller has a round-shaped hub.

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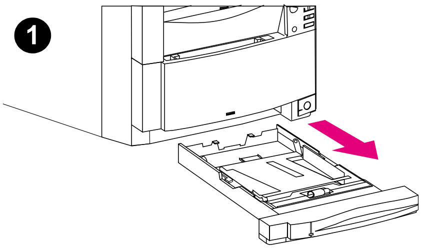

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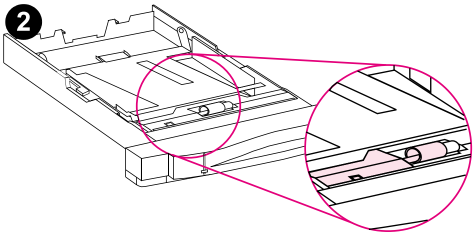

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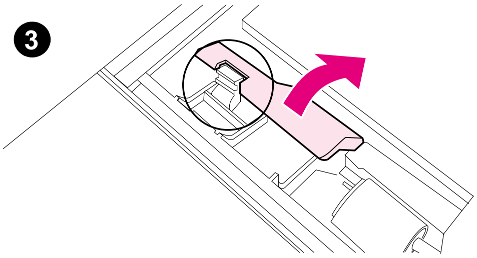

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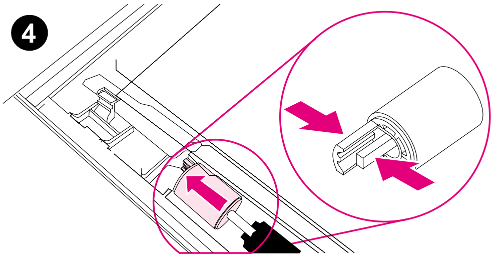
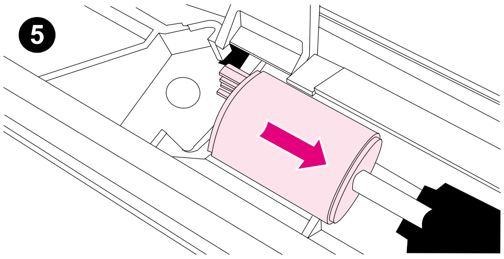


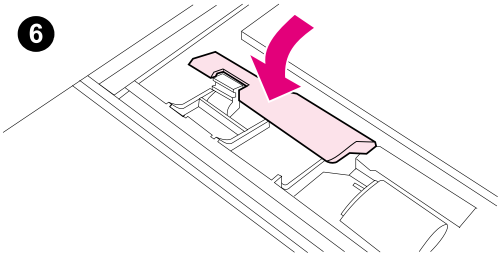
5 Install a new paper roller on Tray 2. Slide the new roller onto the spindle until the roller clicks into place.

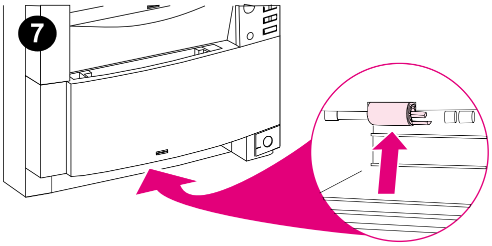
6 Close the cover.

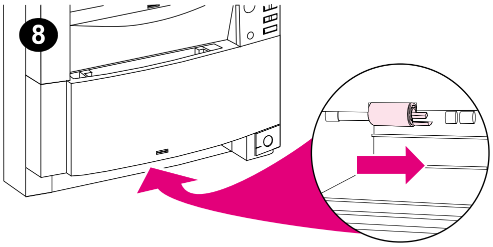
7 Inside the tray cavity on the printer, locate the paper roller in the top of the tray cavity.

8 Squeeze the blue tabs on the roller and remove the old paper roller from the tray cavity.

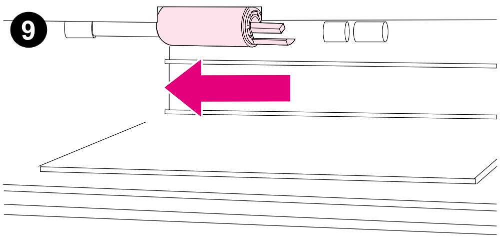




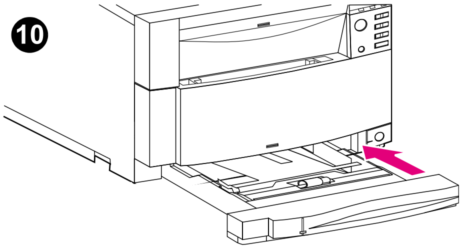




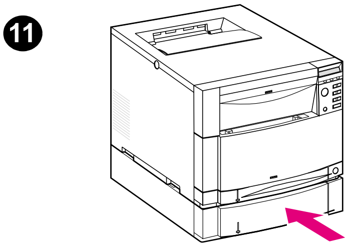
9 Install a new paper roller on the tray cavity. Slide the new roller onto the spindle until the roller clicks into place.



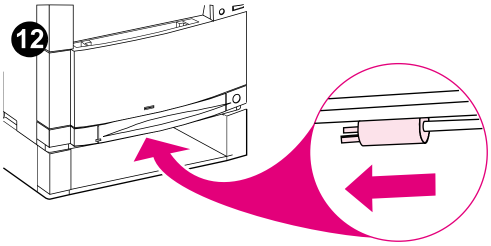
10 Replace Tray 2.

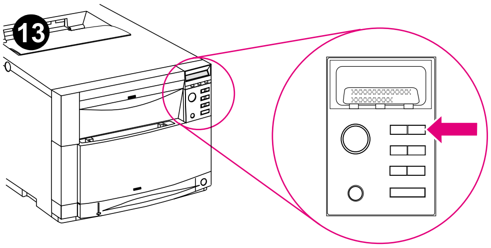


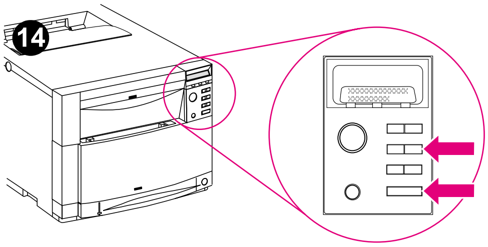
11 If you have the optional 500-sheet paper feeder (Tray 3), repeat steps 3 through 9 to replace the two paper rollers for Tray 3.

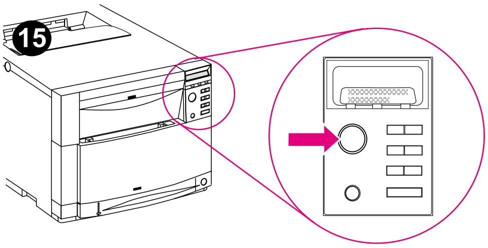


12 Remove the paper roller in the tray cavity for Tray 3 in the opposite direction from the paper roller in the other tray cavity.









13 Turn the printer on. When the printer control panel displays `READY`, reset the printer for the new fuser kit and push [MENU] on the control panel until `RESET MENU` appears.

14 Press [ITEM] until `NEW FUSER KIT, SELECT IF DONE` appears. Then press [SELECT].

15 Press [GO] to return the printer to `READY`.

DIMM configuration

You can add additional Random Access Memory (RAM) to this printer by installing Dual Inline Memory Modules (DIMMs). The HP Color LaserJet 4500 printer uses 100-pin, non-parity, synchronous DRAM memory modules. The HP Color LaserJet 4550 printer uses 168-pin synchronous DRAM memory modules. The SDRAM modules do not need to be configured in pairs (in corresponding left and right slots).

Note Extended Data Output (EDO) DIMMs are not supported.

Adding memory

HP Color LaserJet 4500 printer

You can install 4, 8, 16, 32, or 64 MB DIMMs into the printer’s three DIMM slots. The DIMM slots can be used to add memory, fonts, or firmware upgrades.

HP Color LaserJet 4550 printer

You can install 64 or 128 MB DIMMs into the printer’s two DIMM slots. The DIMM slots may be used to add memory only. You can add fonts or firmware upgrades to the printer’s two 100-pin slots.

Note The HP Color LaserJet 4500 printer will recognize RAM only up to 208 MB. The HP Color LaserJet 4550 printer will recognize RAM only up to 192 MB. Additional memory will not be used by either printer.

To install memory in the printer, you must remove the formatter board from the rear of the printer. To remove the formatter board, remove the six screws shown in Figure 4-4. The DIMMs are then inserted into the available slots in the formatter board. See Appendix A in the online user guide for installation instructions.

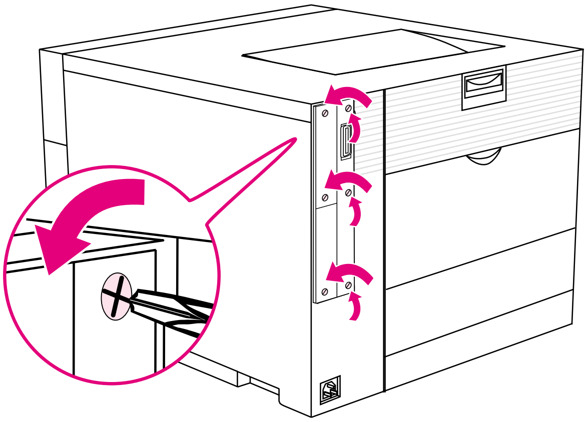


Figure 4-4 **Removing the formatter board**

CAUTION Do not attempt to remove the DIMM in slot #4 (see Figure 4-5) of the HP Color LaserJet 4500 printer, or the DIMM in slot #3 (see Figure 4-6) of the HP Color LaserJet 4550 printer. This DIMM is part of the printer’s firmware. Removing it will affect printer operation.

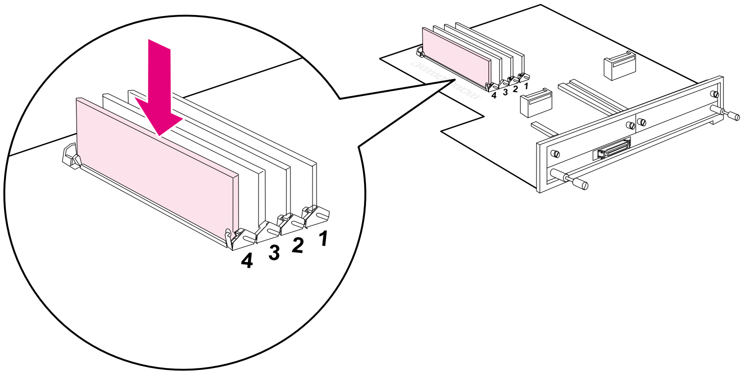


Figure 4-5 Do not remove the DIMM in slot #4.

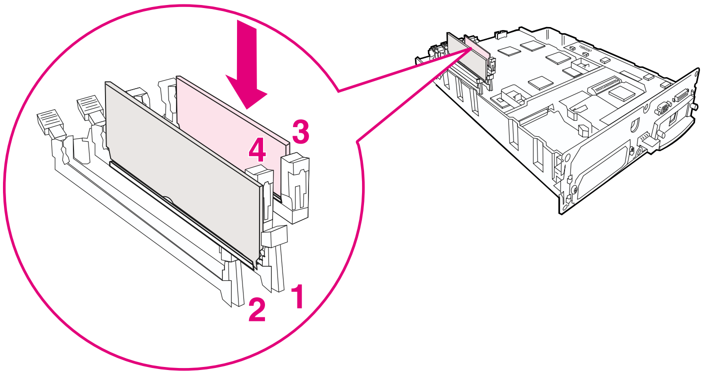


Figure 4-6 Do not remove the DIMM in slot #3.

CAUTION The HP Color LaserJet 4500 printer uses 100-pin, non-parity, synchronous SDRAM DIMMs. The HP Color LaserJet 4550 printer uses 168-pin, non-parity, synchronous DRAM DIMMs; EDO DIMMs are not supported in either the HP Color LaserJet 4500 printer or the 4550 printer. To ensure you are using the correct DIMM, see figure 4-7.

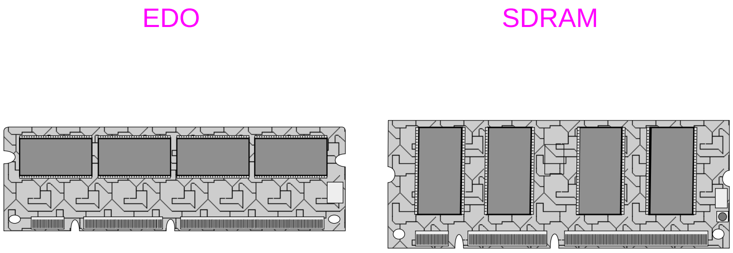


Figure 4-7 EDO and SDRAM memory modules

Non-volatile memory (NVRAM)

The printer uses NVRAM to store I/O and information on the print environment’s configuration. The contents of NVRAM are retained when the printer is deactivated or disconnected. There is one NVRAM on the formatter and one on the DC controller.

5 Theory of operation

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Introduction

This section presents the theory of operation and the functional overview for HP Color LaserJet 4500 series and 4550 series printers. It provides the service representative with an understanding of the printing process.

This chapter is also the course material for the Service Authorization class and discusses the following printing functions:

- Basic operation
- Image formation
- Toner density
- Mechanical system
- Paper path
- DC controller subsystem
- Motors and fans
- Formatter system
- Power supplies
- Toner level sensing system

Basic operation

HP LaserJet 4500 series and 4550 series printer functions are divided into three systems: the image formation system, paper pick-up feed system, and engine control system. These systems are thoroughly described in this chapter.

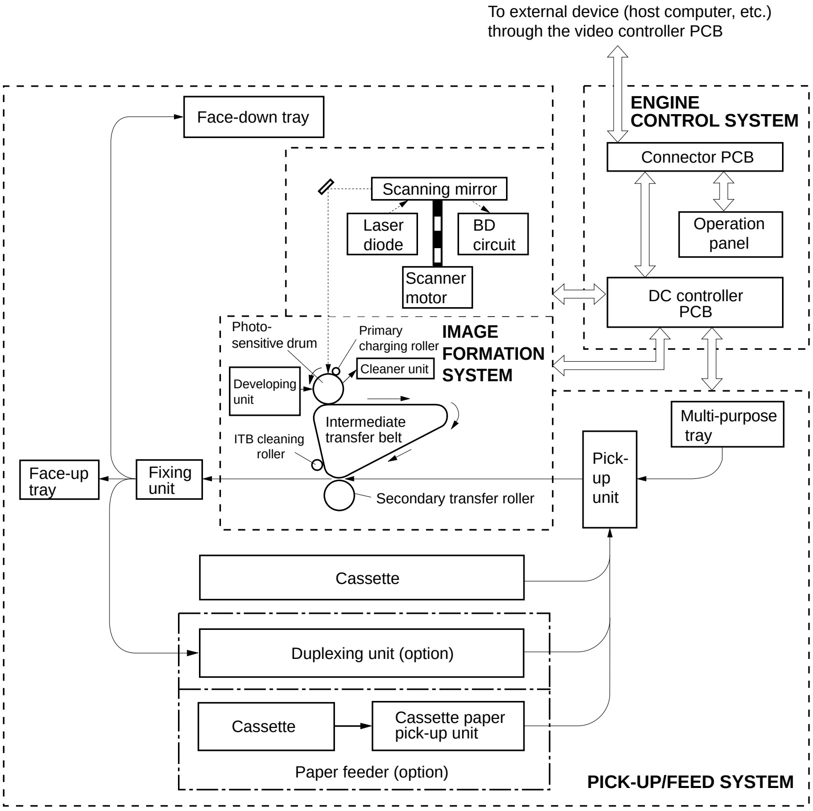

To external device (host computer, etc.) through the video controller PCB
ENGINE CONTROL SYSTEM
Connector PCB
Operation panel
DC controller PCB
Face-down tray
Scanning mirror
Laser diode
BD circuit
Scanner motor
Photo-sensitive drum
Primary charging roller
IMAGE FORMATION SYSTEM
Cleaner unit
Developing unit
Intermediate transfer belt
ITB cleaning roller
Secondary transfer roller
Multi-purpose tray
Pick-up unit
Face-up tray
Fixing unit
Cassette
Duplexing unit (option)
Cassette
Cassette paper pick-up unit
Paper feeder (option)
PICK-UP/FEED SYSTEM

Figure 5-1 **Basic system operation**

Image formation

The image formation system is the central hub of the printer. During image formation, the color image is created.

The image formation system consists of the following imaging units:

- photosensitive drum cartridge
- carousel, laser/scanner
- toner cartridges
- ITB unit
- secondary transfer roller (see Figure 5-2)

A detailed description of the imaging units follows the image formation process.

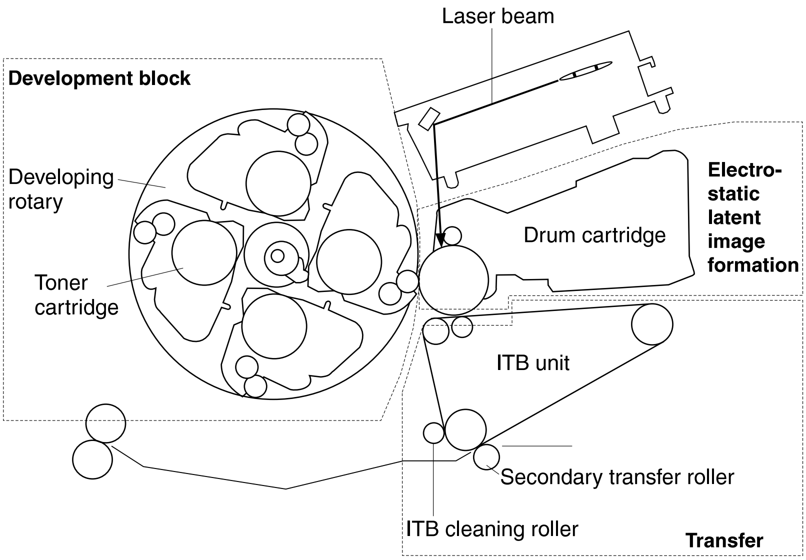

Laser beam
Development block
Developing rotary
Toner cartridge
Drum cartridge
Electro-static latent image formation
ITB unit
Secondary transfer roller
ITB cleaning roller
Transfer

Figure 5-2 **Image formation**

Primary charge

The primary charge roller applies a negative DC bias to the drum. To maintain a consistent charge across the drum's surface, an AC bias is also applied. The charge voltage on the drum surface ranges from approximately -700 V to -500 V. With the large negative charge on the drum surface, an equal positive charge forms below the photoconductive material.

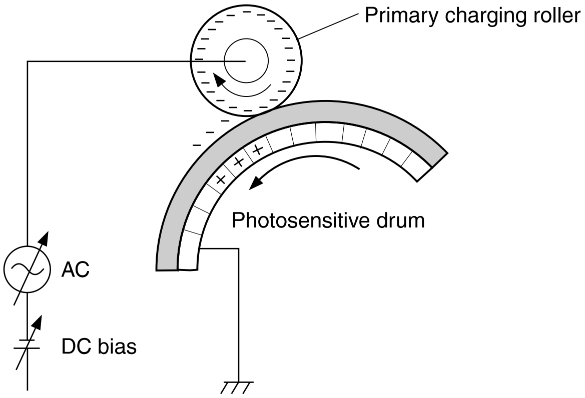

Primary charging roller
Photosensitive drum
AC
DC bias

Figure 5-3 **Primary charge**

Laser exposure

Photoconductive material, in the absence of light, allows the negative charge the charging roller placed on the imaging drum's surface to remain in place. Areas of the photoconductor that are exposed to the laser become conductive and discharge the negative charge on the surface to the metal cylinder of the drum. These discharged areas are what form the electrostatic image.

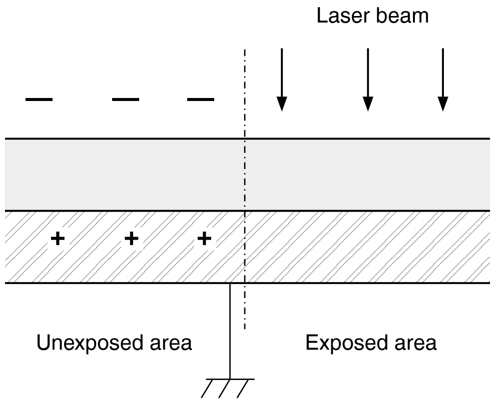

Laser beam
– – –
+ + +
Unexposed area
Exposed area

Figure 5-4 **Laser exposure**

Development

With the toner cartridge in position, a negative charge is applied to the toner particles. As the developer sleeve and drum rotate past one another, the toner particles are drawn to the drum's surface. Areas of the drum's surface that are exposed to the laser attract and hold the toner while the unexposed areas repel the toner.

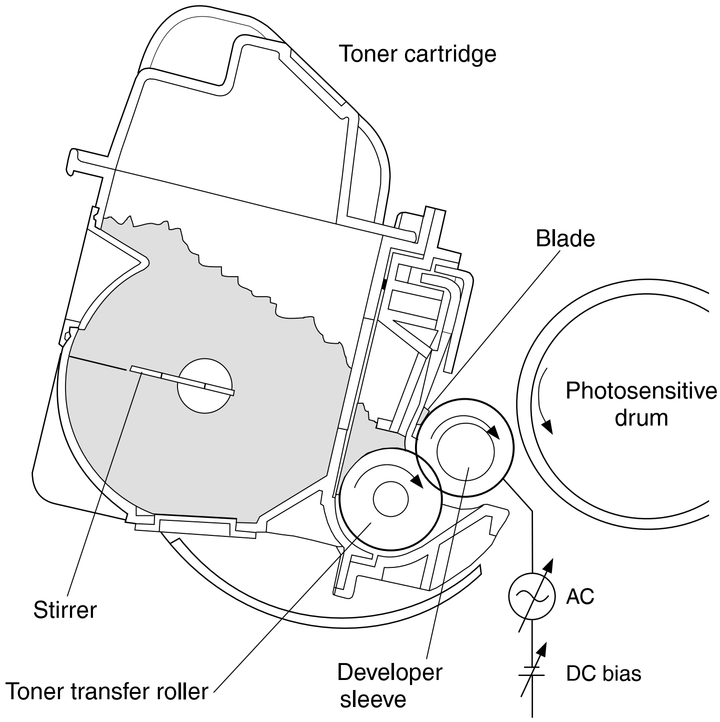

Toner cartridge
Blade
Photosensitive drum
AC
DC bias
Stirrer
Toner transfer roller
Developer sleeve

Figure 5-5 **Development**

Transfer

During transfer, the toner image is transferred from the drum surface to the ITB (primary transfer) and then from the ITB to the paper (secondary transfer).

Primary transfer

The ITB has a primary transfer roller that provides a positive bias that pulls the toner image from the drum to the ITB. This process is repeated four times (one time for each toner cartridge). The positive bias applied by the transfer roller increases with each pass to compensate for increasing layers of toner. As shown in Figure 5-6, the toner particles still maintain their negative charge. Only the transfer belt is charged positively.

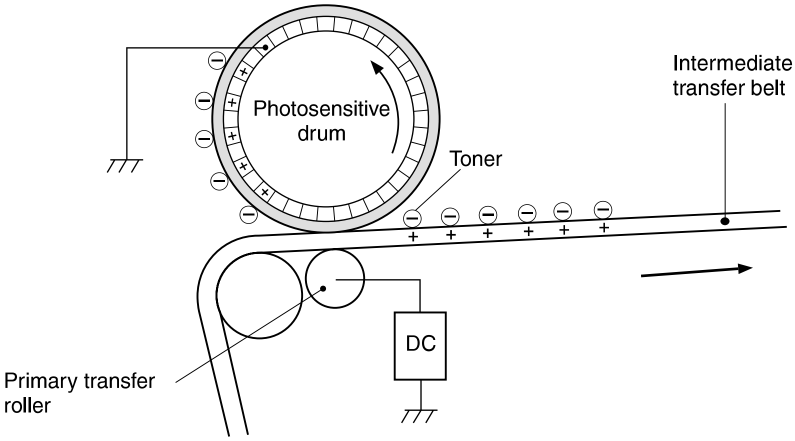


Figure 5-6 **Primary transfer**

Secondary transfer

Once the entire print image is on the intermediate transfer belt, the secondary transfer roller is lifted into position. At the appropriate time, a sheet of media is pulled into the transfer area. With the secondary transfer roller biased at a positive potential, the toner on the ITB is pulled onto the media as the ITB passes over the secondary transfer roller.

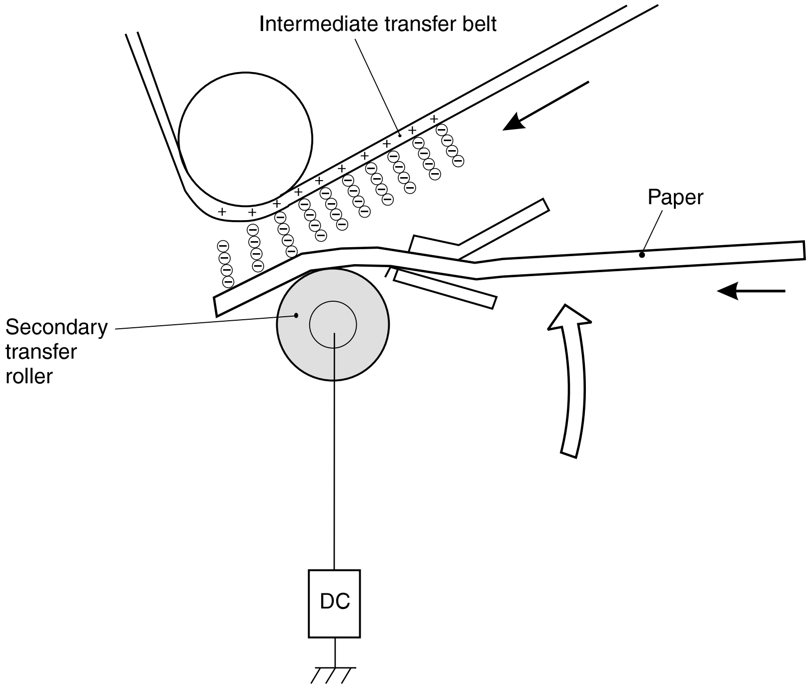

Intermediate transfer belt
Paper
Secondary transfer roller
DC

Figure 5-7 **Secondary transfer**

Separation

As the media passes the secondary transfer roller, it passes over the charge eliminator. The charge eliminator removes any positive charge on the media that came from the secondary transfer roller. The elimination of positive charges decreases adhesion of the paper to the belt and allows for better separation.

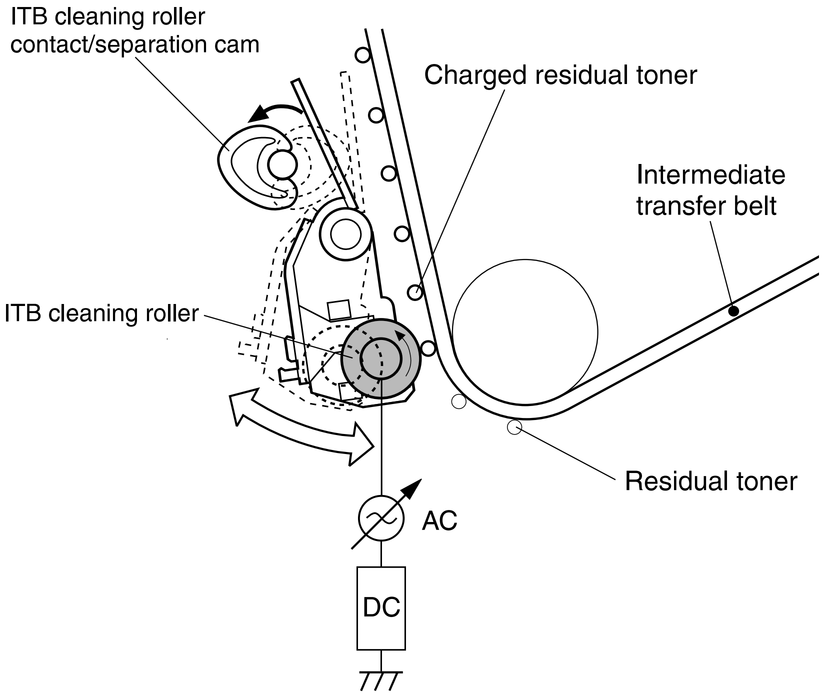

ITB cleaning roller contact/separation cam
Charged residual toner
Intermediate transfer belt
ITB cleaning roller
Residual toner
AC
DC

Figure 5-8 **Separation**

Waste toner cleaning

The waste toner cleaning process begins when residual toner from the ITB is transferred to the photosensitive drum. The toner is then transferred to the waste toner reservoir.

Waste toner cleaning operation

Although most of the toner is transferred from the ITB, some residual toner remains. The ITB cleaning roller moves into position and places a positive charge on the residual toner. When the residual toner reaches the drum, it is transferred to the drum's surface by the drum's negative charge. The residual toner is then transferred from the ITB to the drum.

This waste toner is then removed from the drum's surface by a cleaning blade, collected by the sweeper strip, and placed in the waste toner reservoir by the waste toner transfer plates.

.

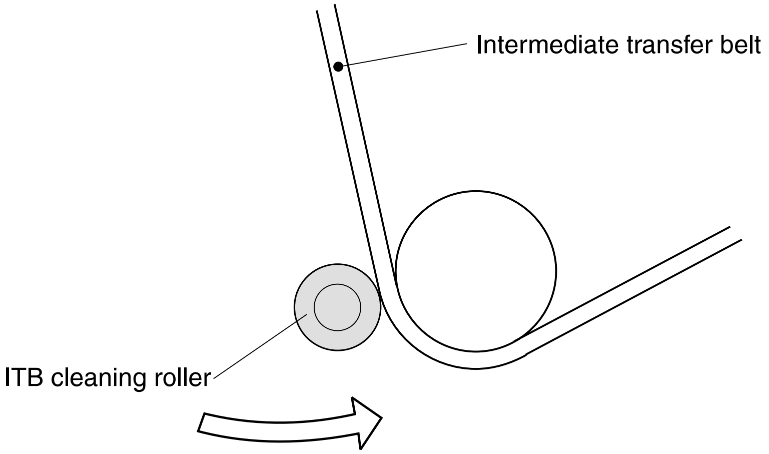

Intermediate transfer belt
ITB cleaning roller

Figure 5-9 **ITB residual toner cleaning**

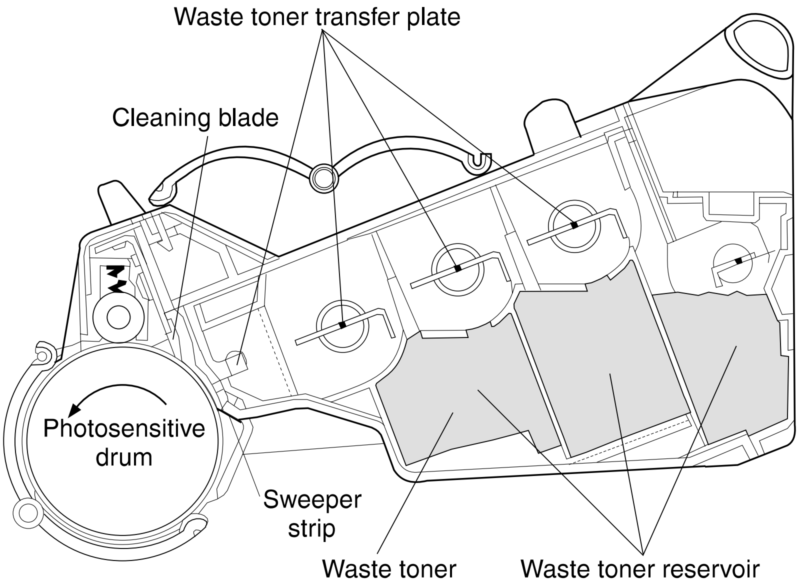

Waste toner transfer plate
Cleaning blade
Photosensitive drum
Sweeper strip
Waste toner
Waste toner reservoir

Figure 5-10 **Waste toner to waste toner reservoir**

Fusing

The final step in the image formation process is the fusing of the toner to the media. The heat and pressure provided by the fusing assembly serve two purposes: to permanently fuse the toner to the media and to melt the toner together to produce the full-color image on the page. This process uses upper and lower rollers made of Teflon tubing to reduce sticking. Both rollers are heated by Halogen heaters, which cause the four colors to fuse and mix on the paper, creating the permanent image.

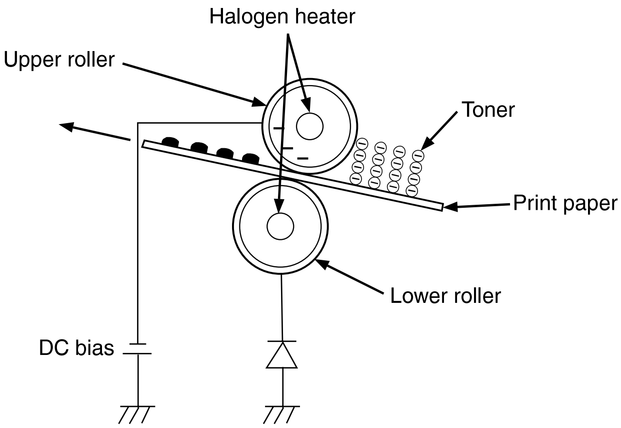

Halogen heater
Upper roller
Toner
Print paper
Lower roller
DC bias

Figure 5-11 **Fuser**

Toner density

Maximum toner density is monitored and corrected if it is outside parameters to prevent variations in the toner density. Toner density can vary as a result of environmental conditions, a deteriorated photosensitive drum, or the amount of toner used.

A pattern of toner patches with varying densities is laid on the photosensitive drum. The DC controller detects the density of these patches and determines the optimum developing bias for each color. The DC controller uses the density sensor (PS14), located in the drum drawer assembly, to read the density of the density detection pattern. PS14 contains a density detection circuit, a light-emitting diode (LED), and photodiodes 1 and 2. To read the density, the sensor emits light from the LED, reflects it off the density detection pattern on the photosensitive drum, and receives it with photodiode 2. Photodiode 1 receives the light directly from the LED. The signals from photodiodes 1 and 2 are then compared to determine density values. Toner density is monitored and corrected during the following occurrences:

- when the power is activated
- after a certain number of sheets are printed
- when a toner cartridge is replaced
- when the drum cartridge is replaced
- when the printer wakes up after a standby mode of six hours or more

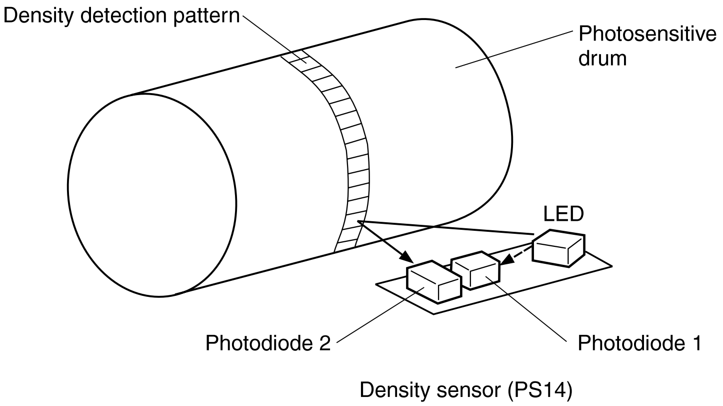


Figure 5-12 **Toner density sensor**

Mechanical system

This section discusses each of the imaging units involved in the image formation process.

Photosensitive drum cartridge

The drum drawer assembly is a user-replaceable assembly that contains the photosensitive drum, primary charging roller, drum memory, and waste toner storage. The drum motor (M4) drives the drum drive assembly, which in turn drives both the photosensitive drum and the ITB (discussed later in the mechanical system). Because the primary charging roller's function was discussed in the image formation section, only the drum memory and waste storage areas are covered here.

Photosensitive drum life

Located inside the drum cartridge is an EEPROM that stores an identification code along with drum life and waste toner information. A life threshold value is used as a comparison number to indicate when the drum has reached its end of life. During printer operation, the DC controller writes to the drum memory at specific times: when power is deactivated, when the drum drawer is opened, or whenever 20 pages are printed.

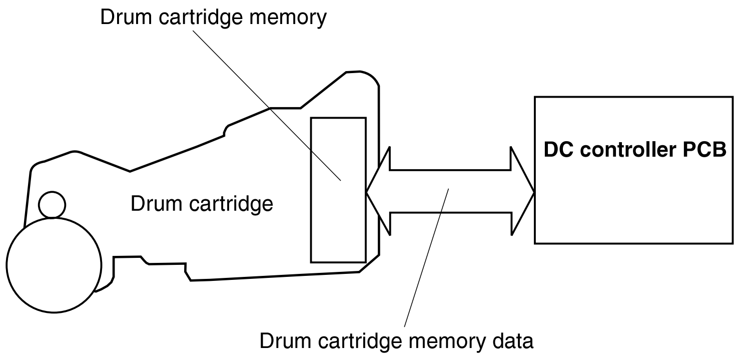


Figure 5-13 **Photosensitive drum cartridge**

Two messages appear as the drum cartridge reaches its end of life. The first is `DRUM LIFE LOW`, which appears on the control panel when about 85 percent of the drum's life has expired. When the drum is 100 percent used, the message `DRUM LIFE OUT` appears and the printer stops printing. A new drum cartridge must be installed at this time.

Waste toner

Inside the drum cartridge are three waste toner reservoirs that store the residual toner left behind during image formation. As discussed earlier in the image formation section, the residual toner from the ITB is transferred to the drum. A cleaning blade scrapes the residual toner off the drum's surface. The waste toner is then carried by toner feed plates into the waste toner reservoirs for storage.

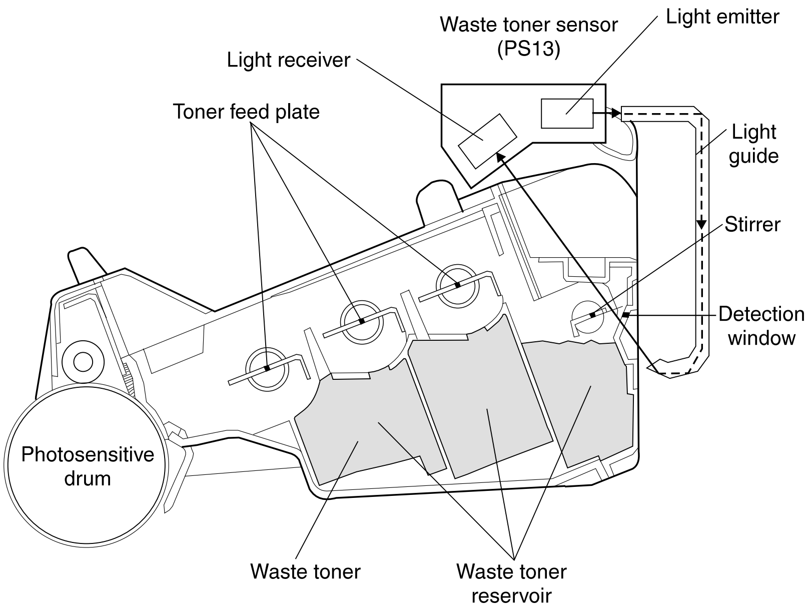

Waste toner sensor
(PS13)
Light emitter
Light receiver
Toner feed plate
Light
guide
Stirrer
Detection
window
Photosensitive
drum
Waste toner
Waste toner
reservoir

Figure 5-14 Waste toner

As the waste toner reservoirs fill, a waste toner sensor (PS13) monitors the level of waste toner. Light from a photo sensor emitter moves along a light guide to a window on the drum. The light passes through one of the waste toner reservoirs, as shown in Figure 5-14, to the receiving side of the waste toner sensor. A stirrer rotates past the window to clean away waste toner to prevent false readings. As the reservoir fills, the length of time the window remains clear shortens. The DC Controller monitors this time and when the threshold is reached the `WASTE TONER FULL` message is displayed on the front panel. At this point, the printer stops printing and the drum cartridge must be replaced. Under normal printing conditions the `DRUM LIFE OUT` message will be seen first. Only when printing full-color pages with a high percentage of coverage or when a lot of waste toner is removed from the ITB will the `WASTE TONER FULL` message be displayed before the `DRUM LIFE OUT` message.

Intermediate transfer belt

The entire print image forms on the intermediate transfer belt (ITB) before being transferred to the media. The image formation section of this chapter includes a description of this process and discusses operation of the motors and other items associated with the ITB. Figure 5-15 shows the components associated with the ITB.

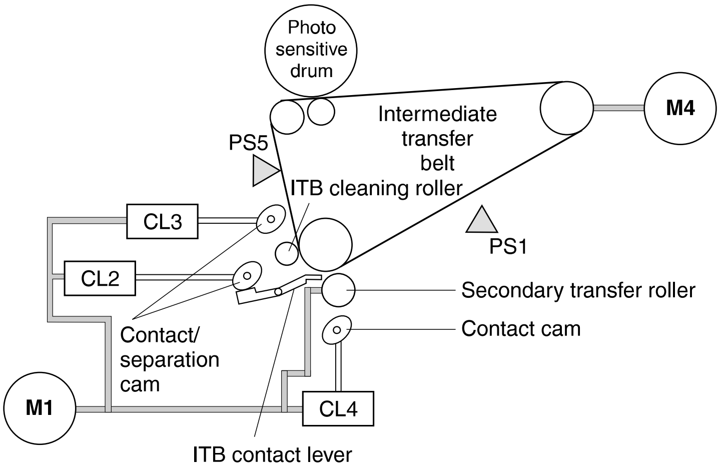


Photo
sensitive
drum
M4
Intermediate
transfer
belt
PS5
ITB cleaning roller
CL3
PS1
CL2
Secondary transfer roller
Contact cam
Contact/
separation
cam
M1
CL4
ITB contact lever

Figure 5-15 Transfer unit function

When the printer receives a print command, the ITB is lifted into position against the drum. This is accomplished when the ITB lift cam is rotated and the cams press against the lift levers located on each side of the ITB. Drive force for the ITB lift cam is provided by M1 and applied to the cam when CL2 is activated.

Once CL2 is activated to lift the ITB, both CL4 and CL3 are activated to position the transfer roller and cleaning roller against the transfer belt. The transfer roller is used to stabilize the belt's side-to-side movement during its initial contact with the drum while the cleaning roller prepares the belt for the image. Just before the black image reaches the transfer roller, both CL4 and CL3 are deactivated again to remove the transfer roller and cleaning roller from the transfer belt. This procedure only occurs when the ITB is lifted into position against the drum.

The print process continues as described in the image formation section. Once the full image is on the ITB, both CL4 and CL3 are activated, and the transfer roller and cleaning roller are moved into position against the ITB. This time the image is transferred from the ITB to the media. Any residual toner left on the ITB is charged positively for removal.

Once the print job is complete, CL4 and CL3 are deactivated and the transfer and cleaning rollers are moved away from the belt. CL2 is then deactivated and the ITB is lowered to move it away from the drum.

Home position detection

The home position of the ITB is detected to precisely transfer the four toners to the intermediate transfer belt and align the leading edge of print paper with the leading edge of the image.

In the area outside of the toner transfer area of the ITB, there are home position detection holes. With the ITB rotating, the home position detection sensor (PS5) detects a hole and sends the information to the DC controller.

When the ITB home position detection signal is detected by the DC controller, it sends a top-of-page signal to the formatter. The formatter sends the image data and the DC controller begins to create the image. For full-color printing, this process is repeated four times to form the image.

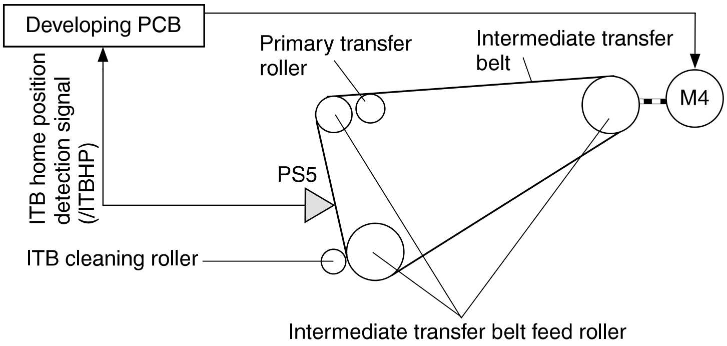

Developing PCB
Primary transfer roller
Intermediate transfer belt
M4
ITB home position detection signal (/ITBHP)
PS5
ITB cleaning roller
Intermediate transfer belt feed roller

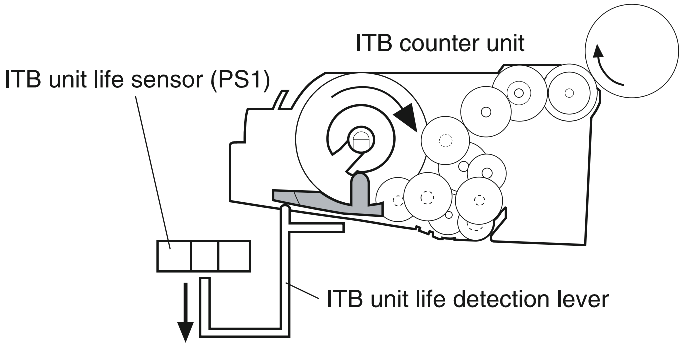
Figure 5-16 **Home position detection**

ITB unit life detection

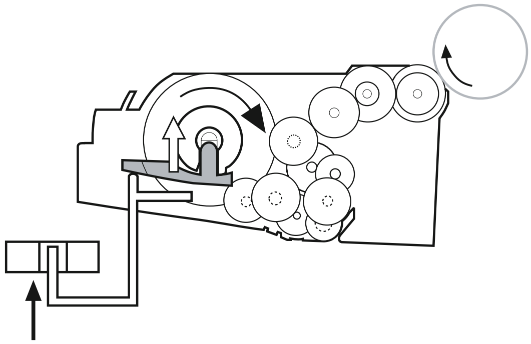
The ITB counter unit is located on the side of the ITB unit. The counter unit consists of a number gears, including the counter gear, and an ITB unit life detection lever. The gears indicate to the ITB counter gear the number of rotations (turns) made by the intermediate transfer belt.

A "page count" is also stored on the formatter, which is used for informational purposes only. When a configuration page is printed, the percentage of ITB life remaining is indicated based upon this page count. If the ITB unit is replaced prematurely or the percentage of life is inaccurate, the page count in the formatter must be manually corrected.

Once the ITB counter gear has rotated one complete turn, the tabbed lever drops into the gear notch. This causes the life detection lever to block light from the ITB unit life sensor (PS1). When light is blocked from PS1, the DC controller sends the formatter a warning that the end of the ITB unit life has been reached.



When the end of the ITB unit life has not been reached



When the end of the ITB unit life has been reached

Figure 5-17 **ITB unit life detection**

Secondary transfer roller unit

The secondary transfer roller is normally detached from the ITB. This operation presses media against the ITB with the secondary transfer roller at the time of secondary transfer. During “first page out,” the secondary transfer roller engages with the belt prior to drum-to-belt image transfer to stabilize the belt from side-to-side movement. The roller stays engaged while the black image is being transferred to the ITB. Just before the black image reaches the secondary transfer roller, the transfer roller disengages from the ITB.

Following image transfer from the photosensitive drum to the ITB and after the paper is positioned in front of the registration rollers, the DC controller turns on the secondary transfer roller clutch (CL4). Once CL4 is on, the secondary transfer roller contact/separation cam rotates and lifts the secondary transfer roller mount. This presses the secondary transfer roller against the intermediate transfer belt prior to the paper arriving from the registration rollers. Bias for the roller is turned on to enable image transfer from the belt to the paper. Once the print job is finished and the paper has passed through the unit, the DC controller then turns CL4 off and secondary transfer roller disengages from the ITB.

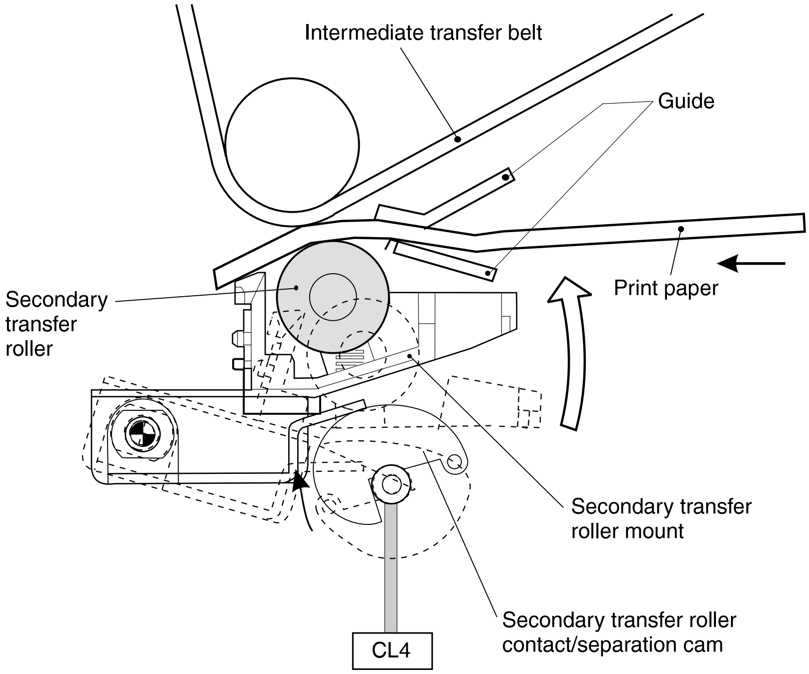

Intermediate transfer belt
Guide
Print paper
Secondary transfer roller
Secondary transfer roller mount
Secondary transfer roller contact/separation cam
CL4

Figure 5-18 Secondary transfer roller unit

ITB unit contact/separation unit

Normally, the intermediate transfer belt is separated from the photosensitive drum. This operation presses the belt against the drum by moving the ITB unit contact lever at the beginning of print operation.

When the fusing unit temperature reaches the print temperature at the beginning of the print operation, the DC controller turns the ITB unit contact/separation clutch (CL2) on. Once the ITB contact/separation clutch is on, the ITB unit contact/separation cam pushes on the ITB contact/ separation lever. This causes the lever to lift up on the ITB until it comes into contact with the photosensitive drum. The ITB will stay engaged with the drum throughout the transfer process. Once the entire print job is complete and CL3 and CL4 have been deactivated, the DC controller turns CL2 off and the ITB is lowered away from the photosensitive drum.

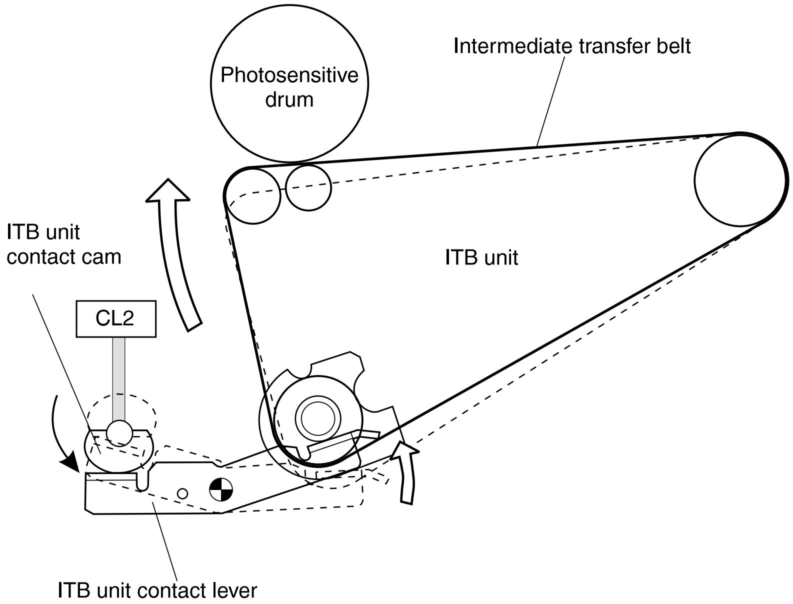

Photosensitive drum
Intermediate transfer belt
ITB unit
contact cam
CL2
ITB unit
ITB unit contact lever

Figure 5-19 **ITB unit contact/separation unit**

Toner carousel

The toner carousel holds the printer’s four toner cartridges: K (black), M (magenta), C (cyan), and Y (yellow).

The carousel motor (M3) rotates the carousel, and the toner cartridge motor (M5) provides the drive for the positioning cam and the developer sleeve.

The carousel contains three sensors: developing carousel position sensor (PS10), toner cartridge contact/separation sensor (PS11), and the toner level sensor (PS12). These sensors, as well as the detailed operation of the carousel assembly, are discussed on the following pages.

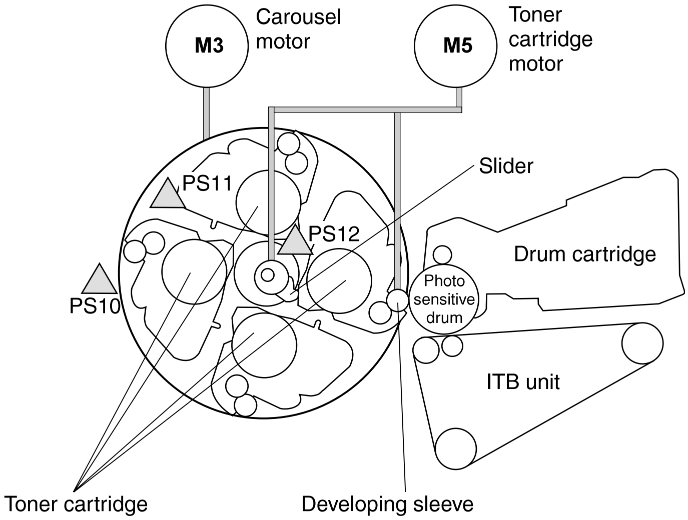


Figure 5-20 Toner carousel assembly

Table 5-1 Toner carousel assembly components

Reference	Description
M5	Toner cartridge motor
M3	Carousel motor
PS10	Carousel position sensor
PS11	Toner cartridge contact/separation sensor
PS12	Toner level sensor

Operation

The DC controller activates the carousel motor (M3) and rotates the carousel. As the carousel rotates, the position sensor (PS10) monitors the carousel for the stop position flags. Each stop position flag is used as a development and toner cartridge removal flag (see Figure 5-21). When a flag is detected, the DC controller monitors the time it takes the flag to pass the sensor (PS10). Each flag is a different width and therefore takes various times to pass the sensor. This time lapse is used by the DC controller to determine which development/removal stop position flag has passed the sensor. When the carousel turns to the correct position, the DC controller stops the carousel motor (M3) and the carousel from rotating any farther.

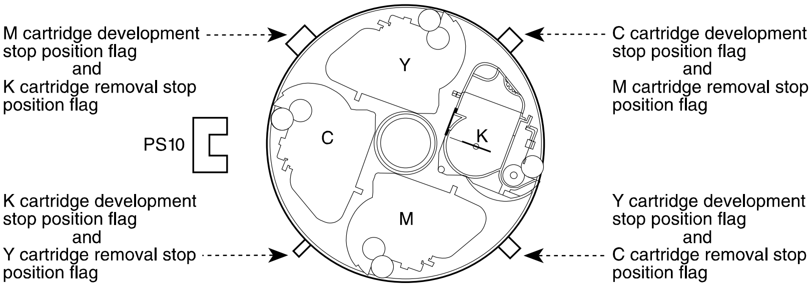

M cartridge development stop position flag and K cartridge removal stop position flag
PS10
K cartridge development stop position flag and Y cartridge removal stop position flag
Y
C
K
M
C cartridge development stop position flag and M cartridge removal stop position flag
Y cartridge development stop position flag and C cartridge removal stop position flag

Figure 5-21 Toner carousel operation

Toner cartridge contact/separation function

This function brings the developing sleeve closer to the photosensitive drum by pushing the toner cartridge push cam out so that the toner cartridge rotates up onto the cam.

The DC controller determines the time lapse of the developing stop position flag with the carousel position sensor (PS10) to determine that the toner cartridge is in position. The DC controller then activates the toner cartridge motor (M5), and the motor begins to rotate clockwise. This causes the toner cartridge push cam to rotate and push out. The toner cartridge then rotates up onto the cam. This positions the toner cartridge and the developer sleeve near the drum and puts the spacers in contact with the drum (see Figure 5-22).

The toner cartridge contact sensor (PS11) detects when the toner cartridge is close to the drum (see Figure 5-22). Once the toner cartridge is facing the drum, the DC controller deactivates the carousel motor (M3), which stops the rotation of the carousel. At the same time, the DC controller starts development by rotating the toner cartridge motor (M5) counter clockwise to begin rotation of the developing sleeve.

Once development is complete, M5 again rotates clockwise, moving the toner cartridge away from the drum. The toner cartridge contact sensor detects when the toner cartridge has moved away from the drum. The carousel motor (M3) again begins the carousel rotation, and the process is repeated for each toner cartridge.

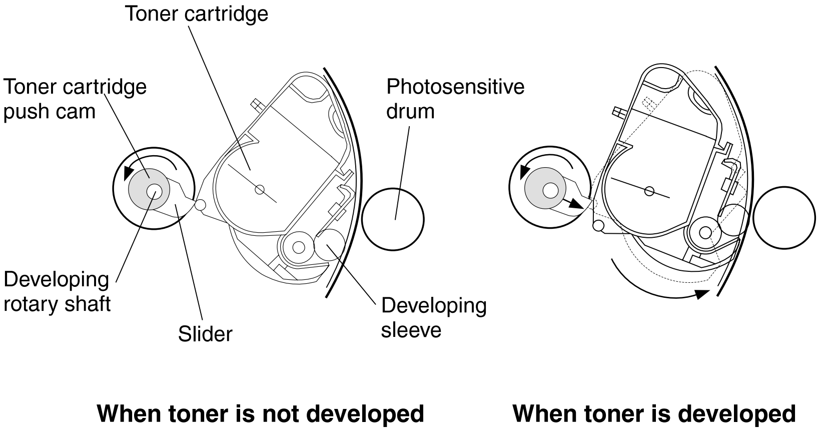

Toner cartridge
Toner cartridge push cam
Photosensitive drum
Developing rotary shaft
Slider
Developing sleeve
When toner is not developed
When toner is developed

Figure 5-22 Toner cartridge contact/separation function

Toner level detection/toner cartridge detection

This function detects the remaining toner level in the toner cartridge and the presence of the toner cartridge in the carousel.

While the toner cartridge is facing the photosensitive drum, light from the light emitter diode passes through the light guide in the carousel and enters the detection port of the toner cartridge. The light passes through the cartridge when the toner around the detection port is scraped off by the cartridge stirring function and is detected by the light receiver of the toner level sensor (PS12) (see Figure 5-23). The printer measures the time it takes for the toner to cover the port again so that light cannot pass through. This measurement determines the amount of toner remaining in the toner cartridge.

When the light passing through the cartridge exceeds a specified time before being interrupted by toner, the DC controller warns the formatter that the toner life is low. The `TONER LIFE LOW` message also appears on the control panel. When light passes through the cartridge all the time without interruption, the printer is stopped by the DC controller, and the formatter is notified that no toner is left in the cartridge. A `TONER OUT` message also appears on the control panel.

Note The stirrer is also used to supply toner smoothly to the sleeve. The toner cartridge motor (M5) rotates the stirrer and the toner feed roller. Both the stirrer and the toner feed roller stir the toner in the toner cartridge.

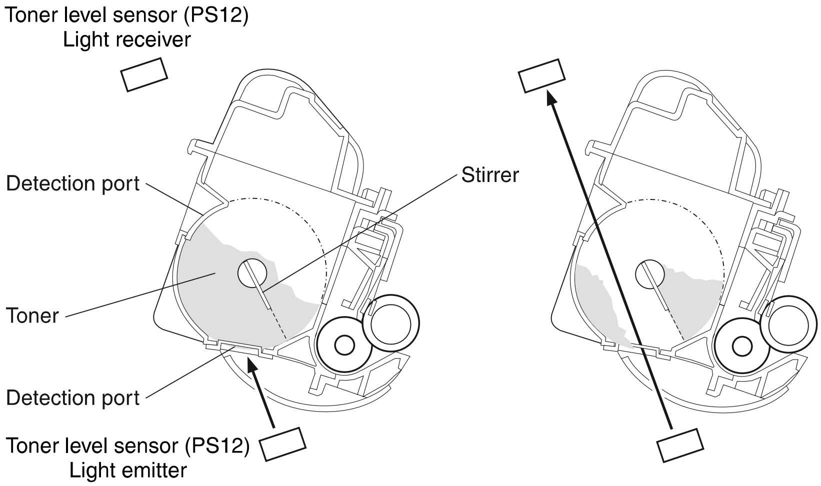


Figure 5-23 **Toner level detection/toner cartridge detection**

Note The Color LaserJet 4550 series has a continuous toner level sensor (CTLS) that was not available in the 4500 series. The continuous toner level sensing printed circuit assembly (PCA) is mounted on the right side of the printer. The sensor allows the printer to track toner usage and to display toner levels on the Supplies Status page.

Laser/scanner operation

The DC controller signals the laser driver to activate the laser diode that generates the laser beam. The laser beam is aligned by the collimator lens and the cylindrical lens (see Figure 5-24). The beam then strikes the six-faced prism mirror located atop the scanner motor, while the mirror is rotating at a constant speed. The beam is then reflected and brought to a point to maintain a consistent round dot (focused) on the drum surface by the focusing lens. At the beginning of the scan line, the beam first strikes the beam detect (BD) mirror and then the BD PCB. After the initial strike, the beam strikes the drum surface. With the drum rotating at a constant speed, the laser beam successively scans across the drum’s surface, exposing the image.

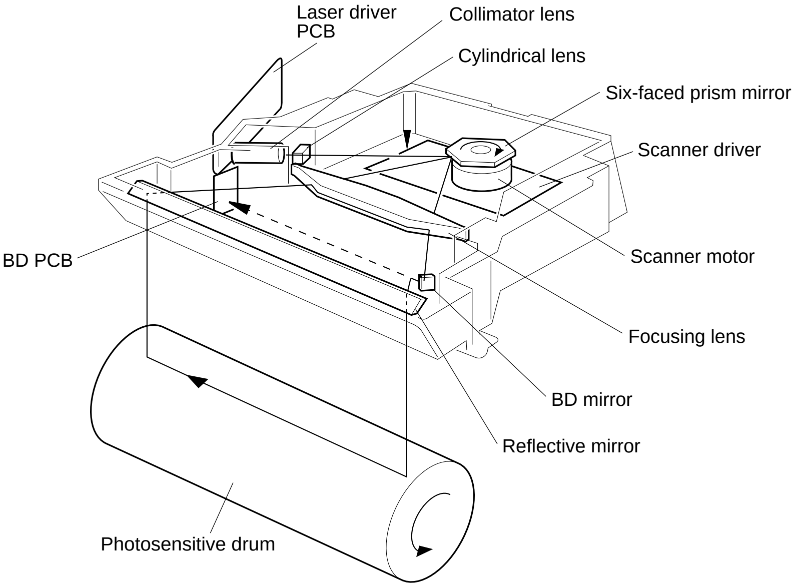

Laser driver PCB
Collimator lens
Cylindrical lens
Six-faced prism mirror
Scanner driver
BD PCB
Scanner motor
Focusing lens
BD mirror
Reflective mirror
Photosensitive drum

Figure 5-24 Laser/scanner operation

Paper path

Introduction

For cassette feeding, a sheet of paper is picked up by the cassette pick-up roller and is then fed by the feed rollers. For manual feeding, a sheet of paper is picked up by the multi-purpose tray pick-up roller and is then fed by the feed rollers. The pick-up motor (M2) provides the drive for the front of the paper path.

Once paper is fed into the general paper path, the paper passes through the registration rollers. The paper is temporarily stopped so that the paper’s leading edge will match the leading edge of the image on the photosensitive drum. The paper then passes between the secondary transfer roller and the ITB. The paper continues past the web transport and past the upper and lower fusing rollers to either the face-up tray or the face-down tray.

The paper path is shown in Figure 5-25.

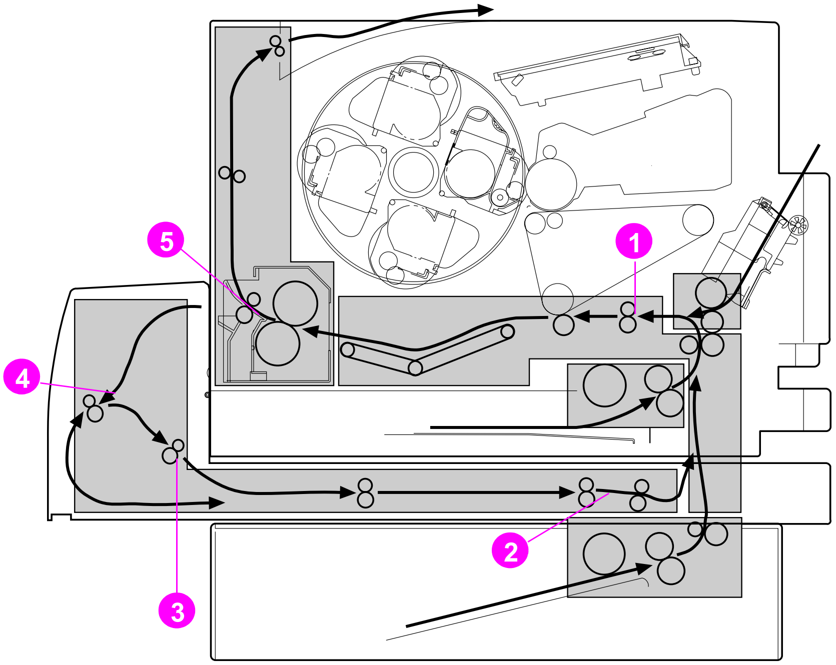


Figure 5-25 **Paper jam sensors** **(shown with the optional 500-sheet paper feeder and duplex unit installed)**

1. Registration paper sensor (PS2)
2. Duplex paper-pick sensor (PS3104)
3. Duplex unit pick-up paper sensor (PS3103)
4. Reversed paper sensor (PS3101)
5. Delivery paper sensor (PS7)

Tray 2 (cassette)

The cassette paper sensor (PS8) senses paper in the cassette. Three paper-size detection switches (SW801, SW802, and SW803) detect both the paper size and the presence of a cassette.

The timing of the paper pick-up and feeding is based on the home position of the ITB. The pick-up motor (M2) provides the drive force for the front of the paper path. Once the paper-size detection switch receives the ITB home position detection signal, the cassette feed solenoid (SL2) is activated and transmits the rotational force of the pick-up motor to the cassette feeding pick-up roller. The roller picks up the paper from the paper cassette.

A separation roller prevents multiple sheets from being fed while paper is fed into the printer's paper path. The cassette feed roller and another feed roller feeds the paper into the printer. The paper passes the registration paper sensor (PS2) and reaches the registration roller. Because the registration roller is not currently rotating, the paper temporarily stops. The paper's leading edge is then curled and any skew is corrected.

The DC controller activates the registration clutch (CL1), which feeds the paper to the secondary transfer unit. The leading edge of the image on the intermediate transfer belt is matched with the leading edge of the paper. The paper is fed to the fusing and delivery units (see Figure 5-26).

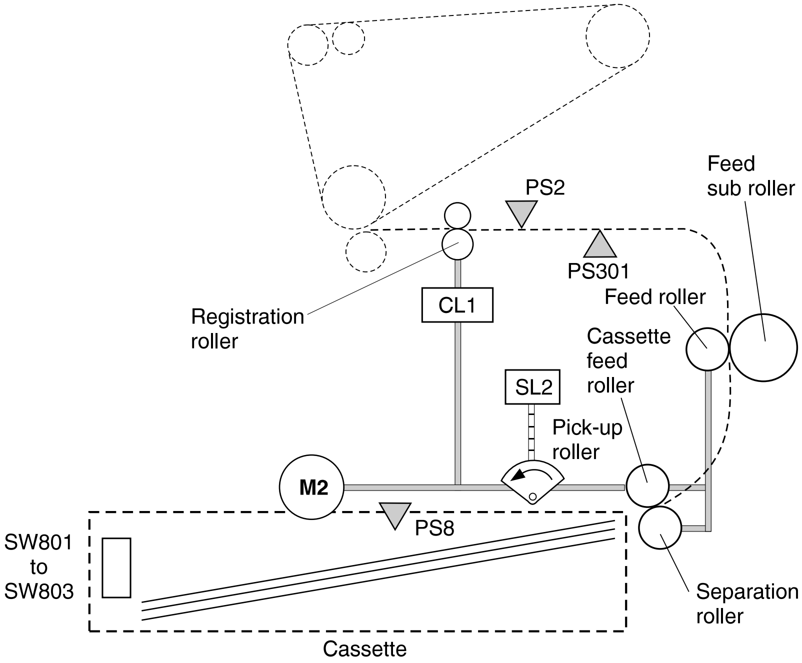


Figure 5-26 **Tray 2 (cassette) operation**

Table 5-2 Motors, solenoids, sensors, and switches

Reference	Description
M2	Pick-up motor
SL2	Cassette pick-up solenoid
CL1	Registration clutch
PS2	Registration paper sensor
PS301	OHT sensor
PS8	Cassette paper sensor
SW801	Paper-size detection switch
SW802	Paper-size detection switch
SW803	Paper-size detection switch

Tray 1 (multi-purpose tray)

The multi-purpose tray paper sensor (PS4) senses the presence of the paper in the multi-purpose tray. The manual feed solenoid (SL1) transmits the rotational force of the pick-up motor to the manual feeding pick-up roller. As the pick-up roller rotates, the pick-up cam pushes up the paper-lifting plate. This causes the paper to be pressed against the pick-up roller and thus picked-up by its rotation. After the separation pad separates multiple sheets, the paper is fed into the printer one sheet at a time.

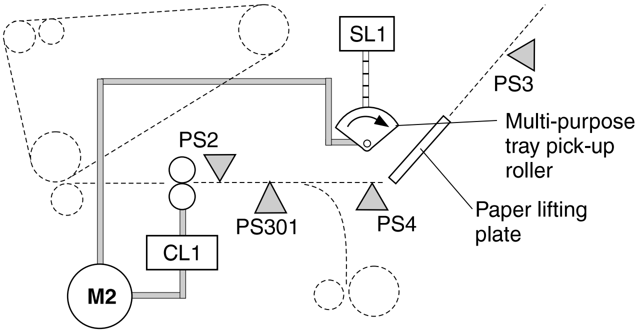


Figure 5-27 Tray 1 manual feed

Table 5-3 Motors, solenoids, clutches, and sensors

Reference	Description
M2	Pick-up motor
SL1	Multi-purpose tray pick-up solenoid
CL1	Registration clutch
PS2	Registration paper sensor
PS3	Last paper sensor
PS4	Multi-purpose tray paper sensor
PS301	OHT sensor

Last paper detected

The printer detects the last page of the print job before writing the next image. This prevents toner particles from smearing on the photosensitive drum and ITB.

To detect the last paper, the last paper sensor (PS3) monitors the rotation of the last paper detection roller on the multi-purpose tray. If there are two or more sheets in the multi-purpose tray, the last paper detection roller does not rotate when one sheet is picked up. Once the last paper is picked up, the last paper detection roller rotates. PS3 monitors this rotation, and a warning message is sent to the control panel.

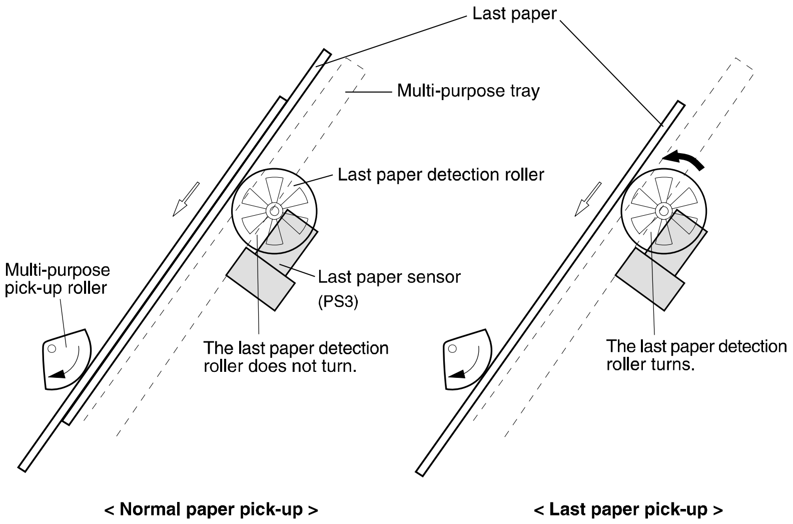

Last paper
Multi-purpose tray
Last paper detection roller
Multi-purpose pick-up roller
Last paper sensor (PS3)
The last paper detection roller does not turn.
The last paper detection roller turns.
< Normal paper pick-up >
< Last paper pick-up >

Figure 5-28 Laser paper detected

Overhead transparency detection

Overhead transparencies (OHT) are detected by the OHT sensor (PS301) located at the front of the registration roller. Light is emitted from PS301 and passes through the paper path, reflected by the reflective mirror, and returned to PS301. As paper passes over PS301, the light emitted from PS301 is blocked by the paper and thus does not return to PS301. Transparencies are detected when the light passes through the OHT which is reflected by the prism, and returns to the sensor. The printer is then switched to OHT mode and changes the paper path speed during transfer and fusing.

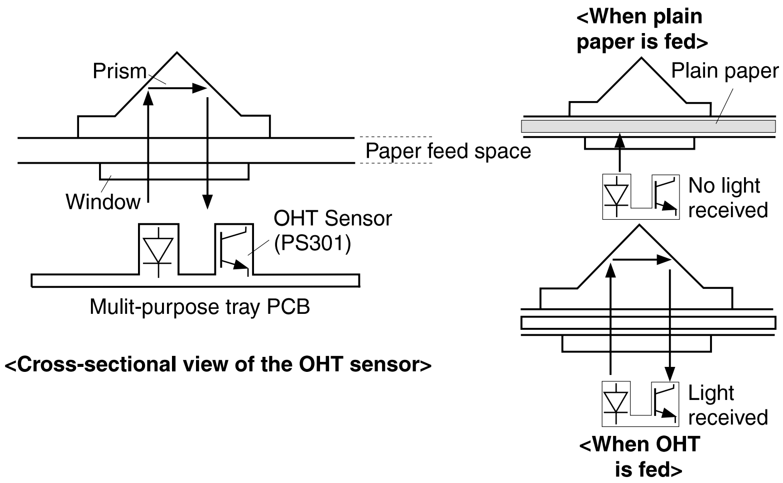

Prism
Window
Paper feed space
OHT Sensor (PS301)
Mulit-purpose tray PCB
<Cross-sectional view of the OHT sensor>
<When plain paper is fed>
Plain paper
No light received
Light received
<When OHT is fed>

Figure 5-29 Overhead transparency sensor

Tray 3 (500-sheet paper feeder)

Power supply

The printer supplies +24 V and +5 V to the paper feeder for power. The paper feeder is controlled by the DC controller. It does not contain a microcomputer (CPU) or a drive motor. Its rollers are controlled by the printer's pick-up motor (M2).

Pick-up and feed system

Three switches (SW3001, SW3002, and SW3003) on the paper feeder PCB detect the paper size and presence of a cassette. The DC controller activates the pick-up motor (M2) and turns on the paper feeder pick-up solenoid (SL3001) after the pick-up motor starts. The paper feeder pick-up roller is activated by the pick-up motor and picks up the paper. Once the separation roller separates the paper from any extra sheets of paper, paper is fed into the printer by the paper feeder feed roller and printer feed roller.

The rest of the paper path is the same as that in the Tray 2 cassette (see Figure 5-26).

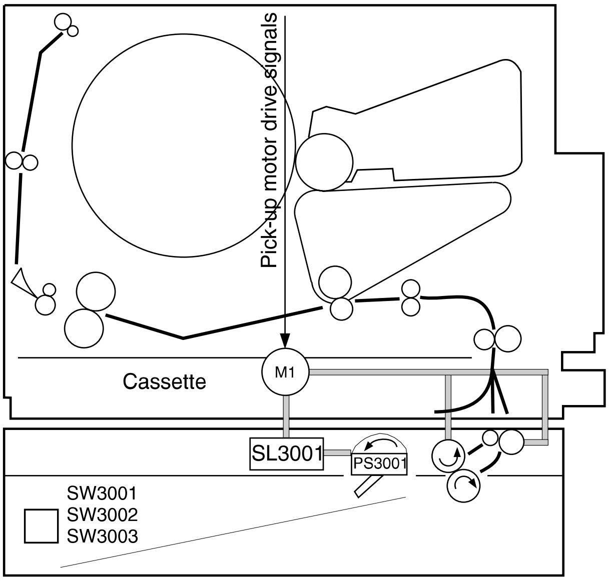


Figure 5-30 Pick-up and feed system

Table 5-4 Solenoids, sensors, switches

Reference	Description
SL3001	Paper feeder pick-up solenoid
PS3001	Paper feeder paper detection sensor
SW3001	Paper feeder paper-size detection switch
SW3002	Paper feeder paper-size detection switch
SW3003	Paper feeder paper-size detection switch

Paper size detection

The paper size and the presence of the cassette are detected by the paper-size detection switches (SW801, SW802, and SW803). The combinations of paper-size detection switches are listed in Table 5-5.

Table 5-5 Paper size detection switches

Paper size	Cassette paper-size detection switch		
	SW801	**SW802**	**SW803**
Legal	OFF	OFF	ON
A4	ON	ON	ON
Letter	OFF	ON	ON
Executive	OFF	ON	OFF
B5	ON	ON	OFF
B5-ISO	ON	OFF	OFF
A5	ON	OFF	ON
No cassette	OFF	OFF	OFF

Fusing and delivery unit

The fusing motor (M1) drives the fusing assembly, and the paper delivery rollers. Paper separated from the ITB is fed into the fusing unit, and output from the fusing unit by the upper and lower fusing rollers and fusing delivery roller. The paper output from the fusing unit is then detected by the delivery unit paper sensor (PS7).

The pressure release sensor (PS6) detects when the fusing roller pressure is off.

The printer uses a deflector to switch between the face-up bin and face-down bin. When the face-up bin is open, the paper is delivered to the face-up bin. When the face-up bin is closed, paper will be delivered to the face-down bin (see Figure 5-31).

If the face-down bin becomes full, it is detected by the face-down bin paper full-sensor (PS9).

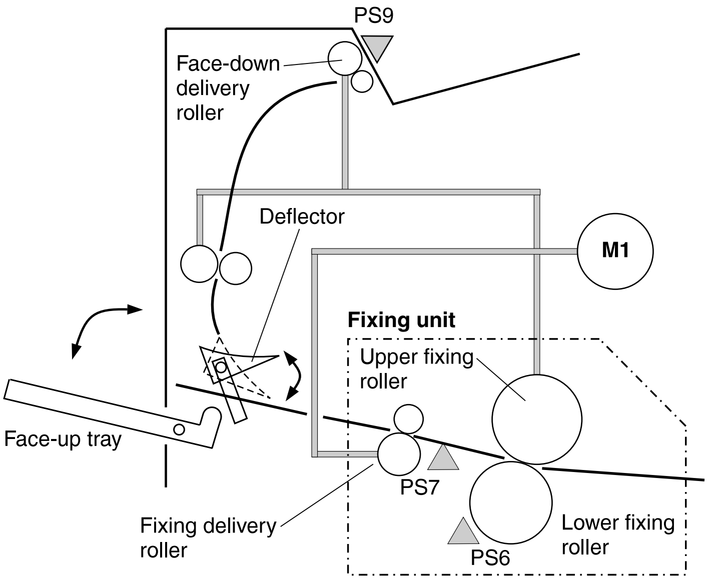


Figure 5-31 **Fusing and delivery unit**

Table 5-6 Fusing and delivery unit components

Reference	Description
M1	Fusing motor
PS6	Fusing unit pressure release sensor
PS7	Delivery unit paper sensor
PS9	Face-down bin full sensor

Duplex unit paper path

Theory

The duplex unit enables printing on both sides of a page. With two-sided printing, known as duplexing, the back side of the page is printed first. Then the page is sent through the duplex unit, where it is flipped over and sent back through the printer for printing on the front.

Power supply

There are two power supplies for the duplexing unit: power supplied by the printer and power supplied by the internal power supply. The CPU requires +5 V of power to be supplied from the printer. This power is also used to supply power to the paper feeder. The external power supply provides +24 V and +5 V, and is used to drive the motors, solenoids, and sensors.

Operation

Paper is fed into the duplexing unit by the duplex feed rollers, which are rotated by the duplex feed motor (M3101). The paper is reversed by the reversing roller, which is rotated by the reversing motor (M3102). The paper is then fed into the printer by the duplexing unit feed roller after the side registration roller is adjusted by the side registration guide (see Figure 5-32).

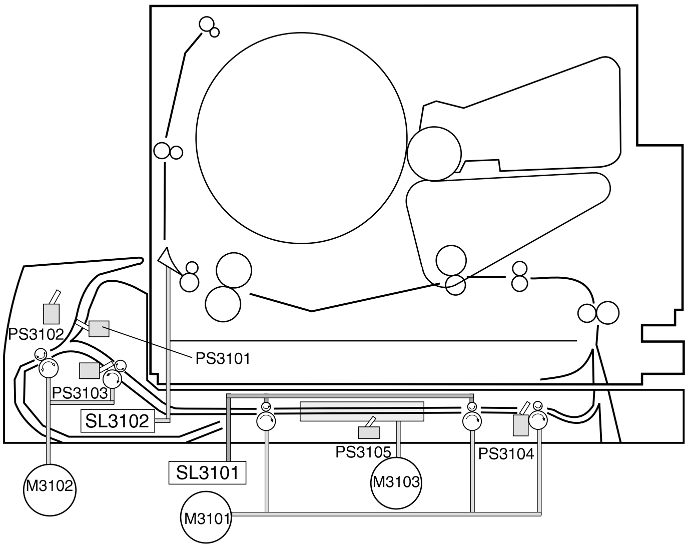


Figure 5-32 **Reversing and duplex pick-up operation**

Table 5-7 Motors, solenoids, and sensors

Reference	Description
M3101	Duplex feed motor
M3102	Reversing motor
M3103	Side registration motor
SL3101	Duplex feed roller pressure release solenoid
SL3102	Delivery deflector solenoid
PS3101	Reversing unit paper sensor
PS3102	Face-up sensor
PS3103	Reversing unit stationary paper sensor
PS3104	Duplex pick-up paper sensor
PS3105	Side registration home position sensor

Reversing operation

The media is guided to the duplex unit with the face-up deflector in conjunction with the face-up tray. If the face-up tray is closed, the delivery deflector solenoid (SL3102) operates the deflector. The duplex driver PCB turns the delivery deflector solenoid (SL3102). The rotation of the delivery deflector solenoid moves the delivery deflector, feeding the media into the duplexer. The reversing motor (M3102) rotates counter clockwise to feed the media into the reversing unit.

Once the reversed paper sensor (PS3101) detects the trailing edge of the paper fed into the reversed unit, the duplex driver PCB changes the paper feed direction by rotating the reversing motor clockwise. Paper is then fed along the lower duplex guide until the paper reaches the duplex feed unit.

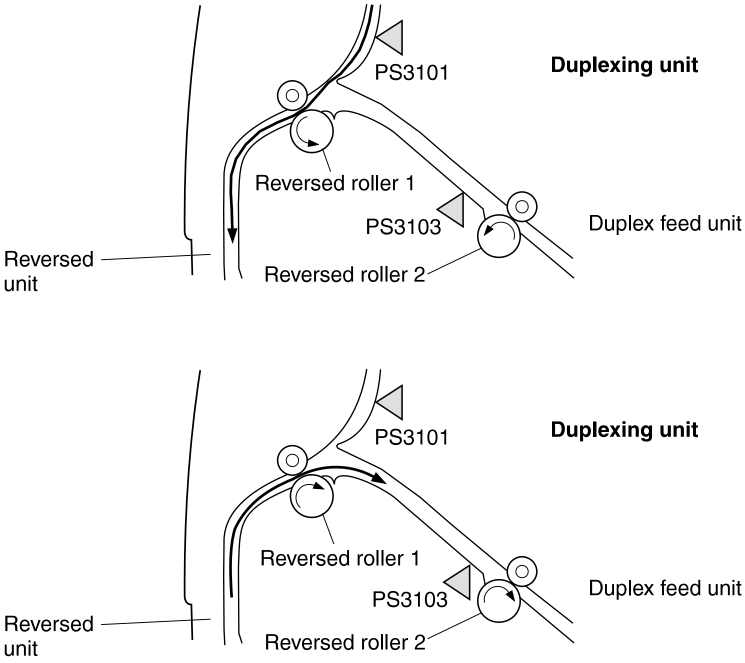

PS3101
Duplexing unit
Reversed roller 1
PS3103
Duplex feed unit
Reversed unit
Reversed roller 2
PS3101
Duplexing unit
Reversed roller 1
PS3103
Duplex feed unit
Reversed unit
Reversed roller 2

Figure 5-33 Reversing operation

Side registration adjustment

The printer adjusts side registration so that the center of the paper (in the horizontal direction), matches the center of the printable area on the ITB when printing on the second side. The side registration guides press against both sides of the paper in order to complete the adjustment.

The duplex driver PCB then drives the side registration motor (M3103) clockwise and moves the home registration guide to the home position. Once the side registration home position sensor (PS3105) detects the home position of the side registration guide, the duplex driver PCB stops M3103 and holds the side registration guide at the home position.

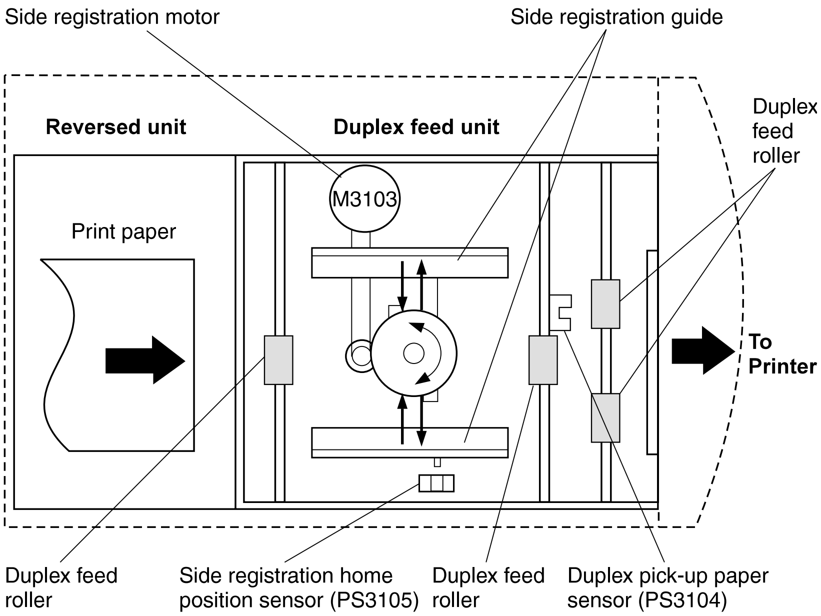

Side registration motor
Side registration guide
Reversed unit
Duplex feed unit
Duplex feed roller
M3103
Print paper
To Printer
Duplex feed roller
Side registration home position sensor (PS3105)
Duplex feed roller
Duplex pick-up paper sensor (PS3104)

Figure 5-34 Side registration adjustment

When the duplex paper pick-up sensor (PS3103) detects paper, the paper is fed along the feed rollers.

Once the duplex paper pick-up sensor (PS3103) detects the paper, the paper is stopped and the paper is freed from the feed rollers.

According to the paper-size data received from the DC controller, the duplex driver runs the side registration motor (M3103) the prescribed number of pulses, moving the side registration guide and aligning the paper position. This completes the side registration in the paper process.

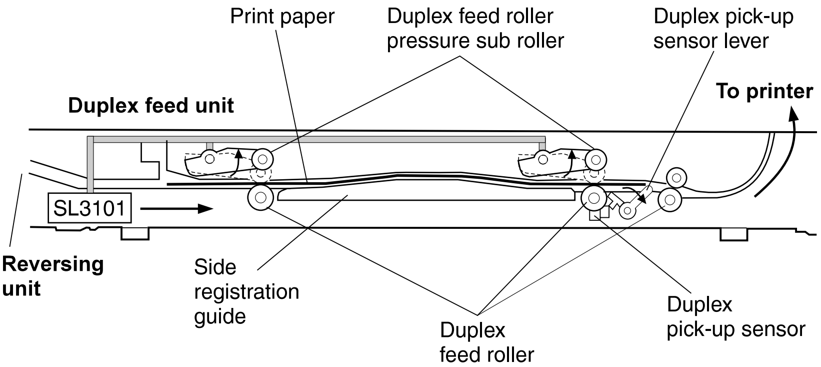

Print paper
Duplex feed roller pressure sub roller
Duplex pick-up sensor lever
Duplex feed unit
To printer
SL3101
Reversing unit
Side registration guide
Duplex feed roller
Duplex pick-up sensor

Figure 5-35 Duplex feed roller pressure

Duplex unit pick-up operation

After the side registration adjustment is completed, the duplex driver sends the refed paper presence status to the printer. Once the status is reviewed by the printer, it sends the duplex unit pick-up command to the duplex driver.

The duplex driver activates the duplex feed motor (M3101) and feeds the paper. When the paper is detected by the registration paper sensor (PS2), the duplex driver deactivates M3101, stopping the paper feed process. The duplex driver then activates M3101 to resume feeding once it receives the refeed command. Once the media is in position, the duplex driver will deactivate M3101 and stop the duplex feed roller. After the second side of paper is printed, the paper is fed to the face-down delivery bin.

DC controller subsystem

The DC controller is responsible for coordinating the entire printing process. The DC controller enables the drive circuitry for the laser beam and coordinates print data from the formatter with paper size, laser beam motion, the high voltage system, fuser temperature, and motors. The DC controller also shares machine status information with the formatter so that proper diagnostic messages appear on the control panel. An overview is shown in Figure 5-36.

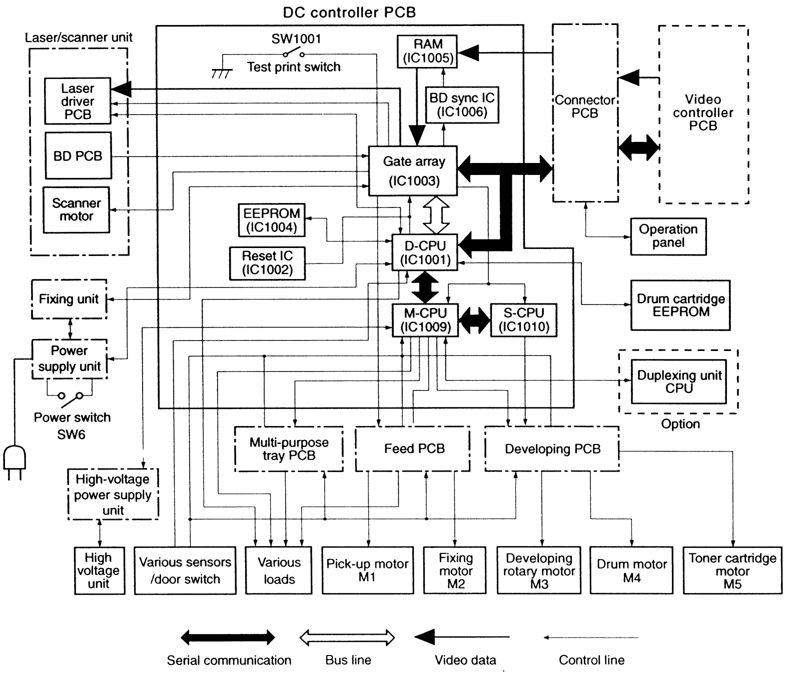

DC controller PCB
Laser/scanner unit
SW1001
Test print switch
RAM (IC1005)
BD sync IC (IC1006)
Connector PCB
Video controller PCB
Laser driver PCB
BD PCB
Scanner motor
Gate array (IC1003)
EEPROM (IC1004)
Reset IC (IC1002)
D-CPU (IC1001)
Operation panel
Drum cartridge EEPROM
Fixing unit
M-CPU (IC1009)
S-CPU (IC1010)
Power supply unit
Duplexing unit CPU
Option
Power switch SW6
Multi-purpose tray PCB
Feed PCB
Developing PCB
High-voltage power supply unit
High voltage unit
Various sensors /door switch
Various loads
Pick-up motor M1
Fixing motor M2
Developing rotary motor M3
Drum motor M4
Toner cartridge motor M5
Serial communication
Bus line
Video data
Control line

Figure 5-36 **DC controller PCB**

Motors and fans

The printer contains five motors that drive the paper pick-up/feed assembly and the image formation assembly. The printer also contains three fans. Figure 5-37 and Table 5-8 illustrate the location of each motor and fan.

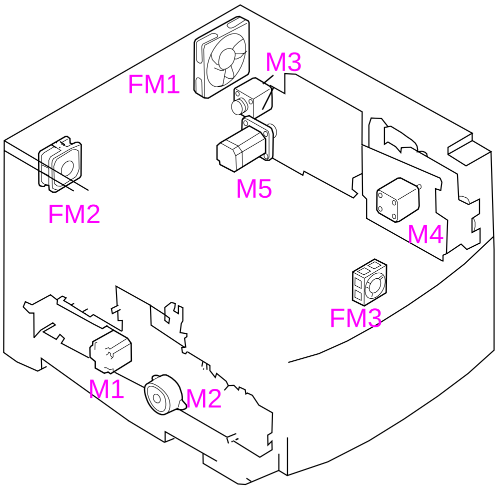


Figure 5-37 **Motors and fans**

Table 5-8 Motor and fan locations

Reference	Components
M1	Fusing motor
M2	Pick-up motor
M3	Carousel motor
M4	Drum motor
M5	Toner cartridge motor
FM1	Large fan
FM2	Small fan
FM3	Front fan

Fusing motor (M1)

The fusing motor is a two-phase stepping motor. This motor operates the fusing assembly secondary transfer roller, feed belt, feed roller, ITB contact clutch, ITB cleaning roller contact clutch, and the secondary transfer contact clutch.

Pickup motor (M2)

The pick-up motor is a two-phase stepping motor. The pick-up motor operates the cassette, multi-purpose tray, paper feeder, and registration roller.

Carousel motor (M3)

The carousel motor is a two-phase stepping motor. The carousel motor operates the toner carousel.

Drum motor (M4)

The drum motor is a two-phase stepping motor. The drum motor operates the intermediate transfer belt (ITB) and the photosensitive drum cartridge and its related components.

Toner cartridge motor (M5)

The toner cartridge motor is a two-phase stepping motor. The toner cartridge motor operates the developer sleeve in the toner cartridge and performs the toner contact/separation function.

Fan motor

The fan motor is a DC brushless motor containing a hall element and the motor driver circuit. The printer has two exhaust fans (FM1 and FM2) and one inducting fan (FM3).

Formatter system

The formatter PCB is responsible for the following:

- receiving and processing print data from the various printer interfaces
- monitoring control panel inputs and relaying printer status information (through the control panel and the bidirectional I/O)
- developing and coordinating data placement and timing with the print engine
- storing font information
- communicating with the host computer through the bidirectional interface
- controlling the PowerSave mode

The formatter PCB receives a print job from the bidirectional interface and separates it into image information and instructions that control the printing process. The DC controller PCB synchronizes the image formation system with the paper input and output systems, and then signals the formatter to send the print image data.

The formatter PCB also provides the electrical interface and mounting locations for two EIO cards and additional memory DIMMs.

CAUTION Never replace both the formatter PCB and the DC controller PCB at the same time. Doing so will result in a complete loss of data. During the removal and replacement of the formatter, data is stored in the DC controller. If the DC controller is also replaced before completing a power-on sequence, all data is lost.

Control panel

The formatter PCB sends and receives printer status and command data via a control panel PCB. If you replace the formatter PCB, updates will be sent to the DC controller PCB and vice-versa.

Power supplies

Power supply overview

There are three power supplies used to power various sections of the printer. There is an AC/DC power supply and a high-voltage power supply. See Chapter 6 for instructions on accessing the power supplies.

AC/DC power supply

The low-voltage power supply circuit supplies +24 VDC and +5 VDC required for the printer and +3.3 VDC and +5 VDC required for the video controller.

It also supplies +24 VDC for the paper pick up motor, scanner motor, and the high-voltage power supply PCB, as well as +5 VDC for the sensors and the ICs on the DC controller PCB.

The front door switch or the rear door switch is deactivated by opening the drum drawer, ITB drawer, toner access cover, or delivery door. These switches are in a series and disable the +24 VDC supply when the drawers, covers, or doors are open.

The low-voltage power supply circuit monitors the 5 V signal fed back from the connector PCB to ensure the 5 V power supply to the formatter.

Overcurrent overvoltage protection

Each DC power supply circuit has an overcurrent protective function and overvoltage protective function. This will prevent a power supply circuit failure by automatically interrupting the output voltage when anomalies, such as a short circuit, develop on the loads that result in overcurrent flow or abnormal voltage.

If this function is activated and no DC voltage is output from the low-voltage power supply circuit, turn OFF the power switch (SW6), unplug the power cord, resolve the anomaly on the load, and then turn ON the power switch (SW6) again.

Note Protective functions remain active for two minutes after activation. Wait for at least two minutes to turn the power back on again.

High-voltage power supply

The printer contains two high-voltage PCBs mounted in one assembly. Together, these PCBs generate the voltage supplied to the primary charging roller, developing sleeve, primary transfer roller, secondary transfer roller, ITB cleaning roller, and upper fusing roller. DC voltage, or superimposed AC voltage and DC voltage, is applied to the primary charging roller, developing sleeve, and ITB cleaning roller. Positive or negative DC voltage is applied to the primary transfer roller and secondary transfer roller. Negative DC voltage is applied to the upper fusing roller.

6 Removal and replacement

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Introduction

Removal and replacement strategy

This chapter explains how to remove and replace major printer components. (HP does not support repairing individual subassemblies or troubleshooting to the component level.)

Replacement is generally the reverse of removal. Occasionally, directions for difficult or critical replacement procedures are included.

WARNING! The information in this section is intended for authorized service personnel only.

Repair notices

WARNING! Turn the printer off, wait five seconds, then unplug the power cord before servicing the printer. Failure to completely disconnect the printer could result in severe injury.

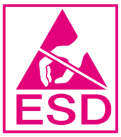
Never operate or service the printer with the protective cover removed from the scanner assembly. The reflected beam, although invisible, can damage your eyes.

Never operate the printer with any parts removed.

The sheet-metal parts can have sharp edges. Be careful not to cut yourself when handling sheet-metal parts.

CAUTION Always protect the imaging drum from light and physical contact when it is removed from the printer. HP recommends reinstalling the original cover whenever the drum is removed from the printer.

Caution regarding electrostatic discharge (ESD)



The printer contains parts that are sensitive to electrostatic discharge (ESD). Watch for the ESD reminder shown at the left when removing printer parts. Protect the parts that are sensitive to ESD with protective ESD pouches.

Determining the printer version

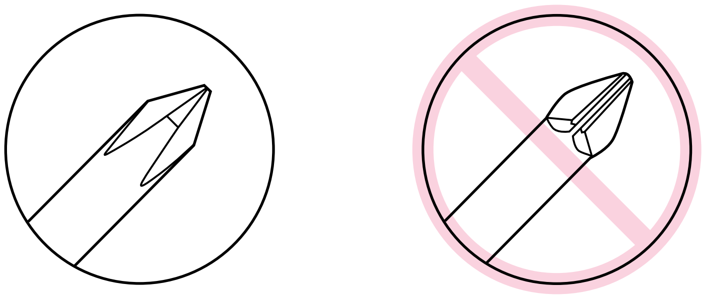
Two versions of the HP Color LaserJet 4500 series printers are available. To accurately perform removal and replacement procedures or determine the correct part for reordering, you will need to know the version of the printer that is being serviced. To identify the printer, check the serial number located at the rear of the printer. All printers will have US or JP in the first two positions of the serial number (e.g., **US**BB123456). Newer versions of the HP Color LaserJet 4500 printers will have an “H” or higher letter in the third position (e.g., US**H**B123456). If the letter in the third position in the serial number is B, C, D, or F, then you have an older version. The HP Color Laserjet 4550 printer is equivalent to the newer version of the HP Color LaserJet 4500 printer, unless otherwise specified.

Required tools

The following tools are needed to service the printer:

- Phillips #2 magnetized screwdriver (152-mm [6-inch] shaft)
- Small flat-blade screwdriver
- Small needle-nose pliers
- ESD strap
- Penlight (optional)

All components in the HP Color LaserJet 4500 printer and the HP Color LaserJet 4550 printer use Phillips-head screws that require a #2 Phillips screwdriver. Ensure that you have a Phillips screwdriver and not a Posidriv screwdriver. Figure 6-1 (below) shows the difference between a Phillips and a Posidriv screwdriver. Note that the Phillips tip has more beveled surfaces.



Phillips

Posidriv

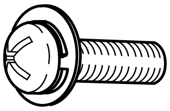
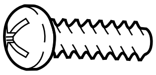
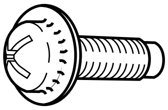
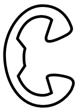
Figure 6-1 **Phillips and Posidriv screwdriver comparison**

Types of screws

Table 6-1 describes the screws used in the printer and provides guidelines to help determine where each type of screw is used. The screws can vary in length depending on the thickness of the material being fastened.

Always note where each type of screw is located and replace each one into its original location.

Table 6-1 Types of screws

Illustration	Description	Uses
	Screw, machine w/washer	To hold plastic to metal. example: printer skins
	Screw, self tapping	To hold plastic to plastic. example: control panel
	Screw, trus head	To hold sheet metal to sheet metal. example: formatter pan
	Retaining ring (e-type)	To hold a bolt through a slot. example: toner catridge carousel

Consumable assemblies

The user replaces consumable assemblies as part of periodic maintenance. Chapter 4 explains the maintenance procedures.

Note The printer tracks the amount of use on some of its user-replaceable parts by keeping a page count. Swapping consumable assemblies between printers might cause a misrepresentation of consumable assembly life values and is not recommended.

Table 6-2 Approximate replacement interval for consumable items

Consumable	Printer message	Page count	Approximate time period[1]	To install
Black (K) toner cartridge	`TONER K LOW` or `TONER K OUT`	9,000 pages [2]	4.5 months	See page 86.
Cyan (C) toner cartridge	`TONER C LOW` or `TONER C OUT`	6,000 pages [2]	3 months	See page 86.
Magenta (M) toner cartridge	`TONER M LOW` or `TONER M OUT`	6,000 pages [2]	3 months	See page 86.
Yellow (Y) toner cartridge	`TONER Y LOW` or `TONER Y OUT`	6,000 pages [2]	3 months	See page 86.

Drum kit	**4500:**
	`DRUM KIT LOW` or
	`DRUM KIT OUT`
	`REPLACE DRUM KIT`
	4550:
	`DRUM KIT LOW`
	`ORDER DRUM KIT`
	`DRUM KIT OUT`
	`REPLACE DRUM KIT`
		25,000 black and white only pages, or 6,250 color pages	12.5 months for black and white only pages, or 3 months for color pages	See page 88.

Transfer kit	**4500:**
	`TRANSFER KIT LOW` or
	`TRANSFER KIT OUT`
	`REPLACE KIT`
	4550:
	`TRANSFER KIT LOW`
	`ORDER TRANSFER KIT`
	`TRANSFER KIT OUT`
	`REPLACE KIT`
		100,000 black and white only pages, or 25,000 color pages	50 months for black and white only pages, or 12.5 months for color pages	See page 89.

Fuser kit	**4500:**
	`FUSER KIT LOW` or
	`FUSER KIT OUT`
	`REPLACE KIT`
	4550:
	`FUSER KIT LOW`
	`ORDER FUSER KIT`
	`FUSER KIT OUT`
	`REPLACE KIT`
		100,000 black and white only pages, or 50,000 color pages	50 months for black and white only pages, or 25 months for color pages	See page 92.

[1] Approximate lives are based on 2,000 pages per month.

[2] The approximate average A4/letter-size page count is based on 5 percent coverage of individual toner colors. Page counts are only estimations; usage conditions and print patterns can cause results to vary.

CAUTION Hewlett-Packard recommends the use of HP products in this printer. Use of non-HP products can cause problems that require service that is not covered by the Hewlett-Packard warranty or service agreements.

Covers, drawers, and top and front assemblies

Top cover

To remove the top cover

1 Open the drum drawer (top drawer) until it clears the top cover, and then remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2 Push the release button on the left side of the printer and open the top cover.

3 Open the rear door(s) of the printer.

4 Remove the air filter.

5 Remove the two screws from the top cover as shown in Figure 6-2.

6 Lift up on the rear corners of the top cover to release the plastic retaining tabs from the side cover.

7 Rotate the back of the cover toward the left side of the printer, then lift to remove it.

Top cover replacement tip

- When replacing the top cover, be sure to properly seat the two plastic retaining tabs on the front of the cover.
- Be sure to firmly seat the top cover.

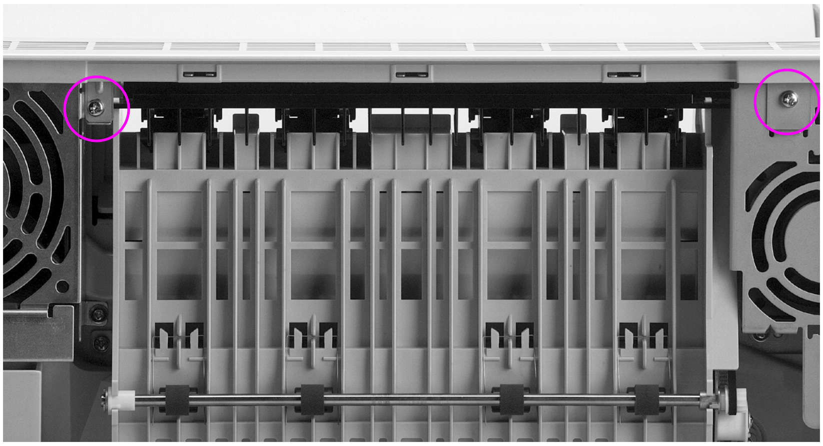


Figure 6-2 **Top cover removal and replacement (rear view of printer)**

Left side cover

To remove the left side cover

1. Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.
2. Remove the top cover.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

3. Open the ITB drawer (middle drawer) and Tray 2.
4. Remove the two screws as shown in callout 1 of figure 6-3.
5. Carefully pull out the bottom of the left cover, disengage the two tabs located behind the cover (see callout 2 of figure 6-3), and then lift the cover up and off.

CAUTION Be careful to not break the tabs when pulling out the bottom of the cover.

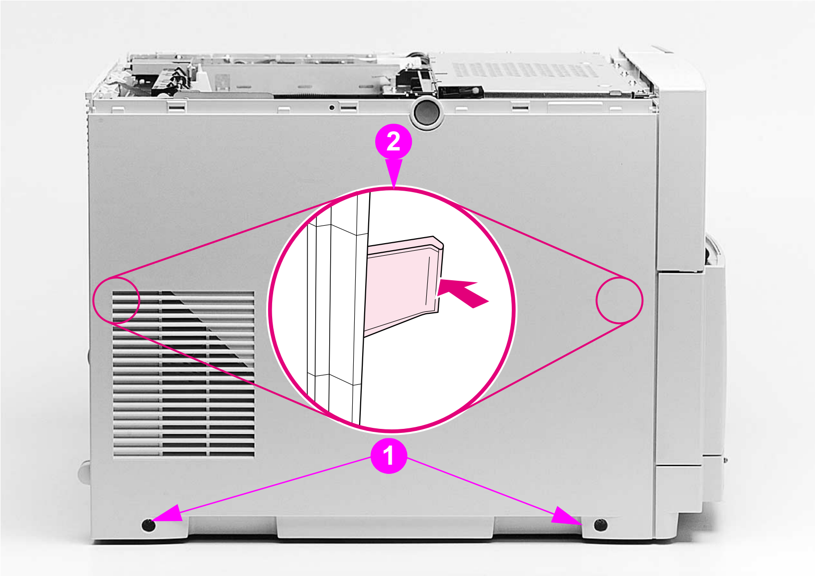


Figure 6-3 **Left side cover removal and replacement**

Right side cover

To remove the right side cover from the printer

1 Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.

2 Remove the top cover.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

3 Open the ITB drawer (middle drawer) and Tray 2.

4 Remove the two screws shown in callout 1, Figure 6-4.

5 Carefully pull out the bottom of the cover, and disengage the two tabs located behind the cover (see callout 2, Figure 6-4) by sliding the cover to the rear. Lift the cover up and off.

Reinstallation tip

CAUTION When reinstalling the cover, ensure that the tabs on the inside of the cover (callout 2, Figure 6-4) are seated properly by pushing in firmly on the tabs while sliding the cover forward into position.

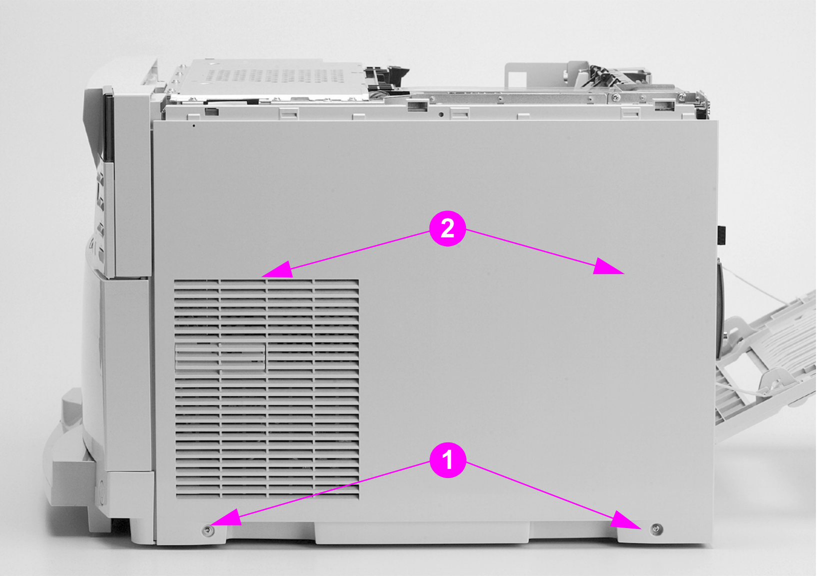


Figure 6-4 **Right side cover removal and replacement**

Rear door

To remove the rear door

1. Open the rear door of the printer.
2. Push in the retaining strap connectors to release the two plastic retaining straps attached to the inside of the rear door as shown in Figure 6-5.
3. Slide the bottom of the rear door to your right until the plastic guide-pin clears the guide-pin harness attached to the printer.
4. Remove the rear door.

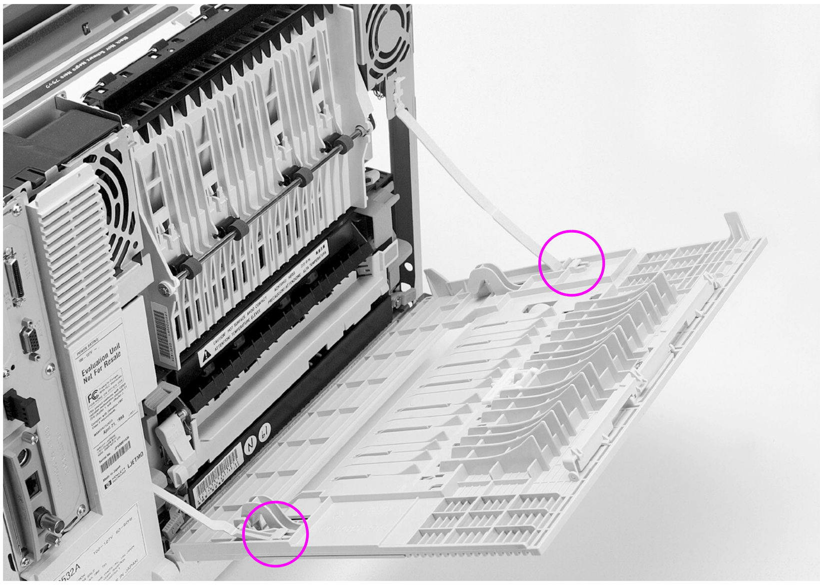


Figure 6-5 **Rear door removal and replacement**

Right rear cover

To remove the right rear cover

Note Remove the duplexer, if installed.

1. Remove the top cover.
2. Remove the right side cover.
3. Remove the screw as shown in Figure 6-6.
4. Rotate the top of the cover toward the left side of the printer and remove the cover.

Reinstallation tip

Ensure that the lip on the lower right side of the cover slides behind the lower rear cover.

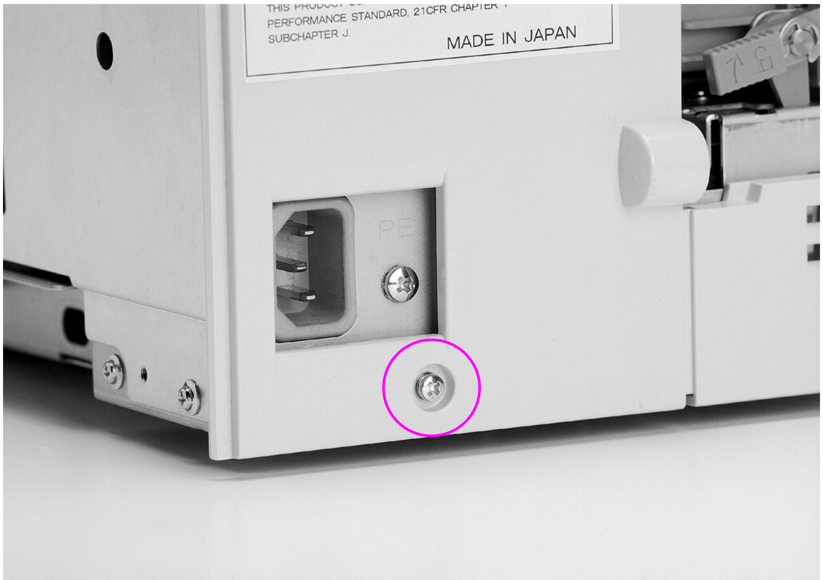

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Figure 6-6 **Right rear cover removal and replacement**

Drum drawer (top drawer) cover

To remove the drum drawer (top drawer) cover

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. To identify which printer version you are servicing, see page 140. The HP Color LaserJet 4550 printer is equivalent to the newer version of the HP Color LaserJet 4500 printer, unless otherwise specified.

1 Open the drum drawer (top drawer) and remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2 Remove the two screws in the newer version HP Color LaserJet 4500 printer and HP Color LaserJet 4550 printer (callout 1, Figure 6-7) or four screws in the older version HP Color LaserJet 4500 printer (callout 2, Figure 6-7) from the inside of the drawer cover.

3 Reach beneath the drum drawer (top drawer) cover, firmly grasping beneath the center of the cover. Then, pull down slightly on the cover, rotating the bottom out toward you. Lift the cover up to remove.

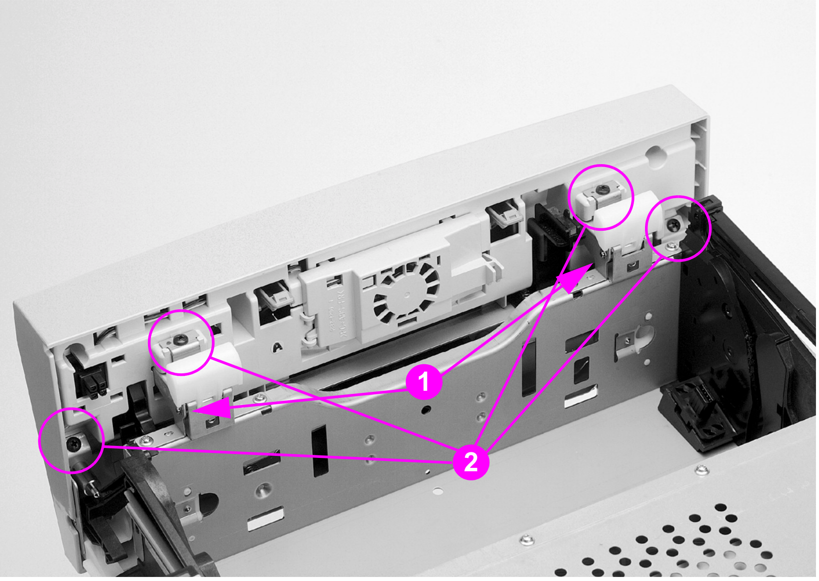


Figure 6-7 Drum drawer (top drawer) cover removal and replacement

Drum drawer (top drawer) cover replacement tip

When replacing the drum drawer (top drawer) cover, carefully insert the black plastic tabs into the black plastic levers (Figure 6-8).

Note In newer version HP Color LaserJet 4500 and HP Color LaserJet 4550 printer, insert the metal tabs (located just inside the black plastic tabs shown in Figure 6-8) into the drum drawer (top drawer) cover before latching the cover onto the bottom of the drum drawer.

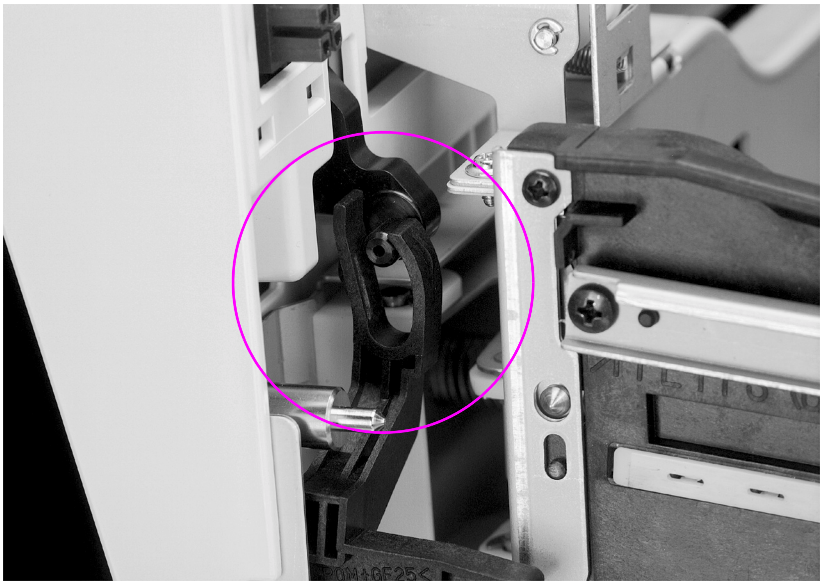


Figure 6-8 **Drum drawer (top drawer) cover tabs and levers**

ITB drawer (middle drawer) cover

To remove the ITB drawer (middle drawer) cover

1. Open the ITB drawer (middle drawer) until it stops.
2. Remove the two screws in the top of the ITB drawer (middle drawer) cover as shown in Figure 6-9.
3. Lift up on the cover slightly. Tilt the top toward you and then down to clear the two plastic retaining tabs located in the lower middle of the cover and remove the cover.

ITB drawer (middle drawer) cover replacement tip

Secure the two plastic retaining tabs at the bottom of the cover prior to reassembling the ITB drawer (middle drawer) cover.

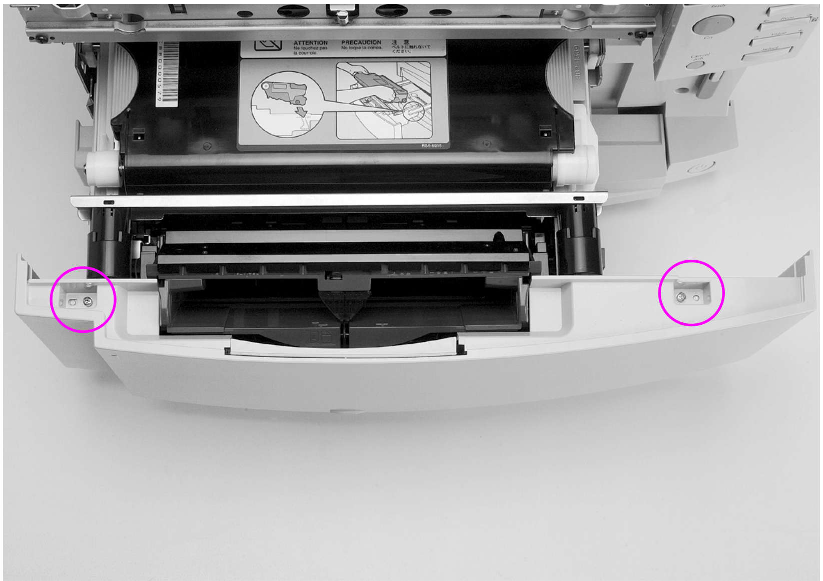


Figure 6-9 ITB drawer (middle drawer) cover removal and replacement

ITB drawer (middle drawer)

To remove the ITB drawer (middle drawer)

1. Pull the ITB drawer (middle drawer) completely out until it stops.
2. Remove the intermediate transfer belt (ITB).
3. Lift the drawer, clearing the first set of guide wheels from the guide rail (Figure 6-10). Pull the guide rails until the next set of guide wheels stop, and then lift to clear the second set of guide wheels from the guide rails.

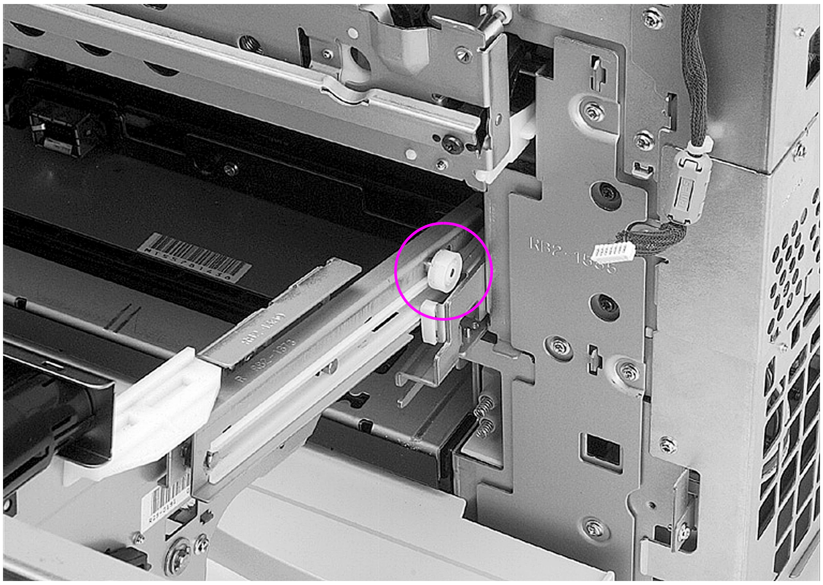


Figure 6-10 **ITB drawer (middle drawer) removal and replacement**

Control panel

To remove the control panel

1. Remove the top cover.
2. Open the ITB drawer (middle drawer).
3. Remove the black self-tapping screw as shown in Figure 6-11.
4. Pull the bottom of the control panel out to clear the alignment pin.
5. Lift the control panel up to access the cable.
6. Disconnect the cable.

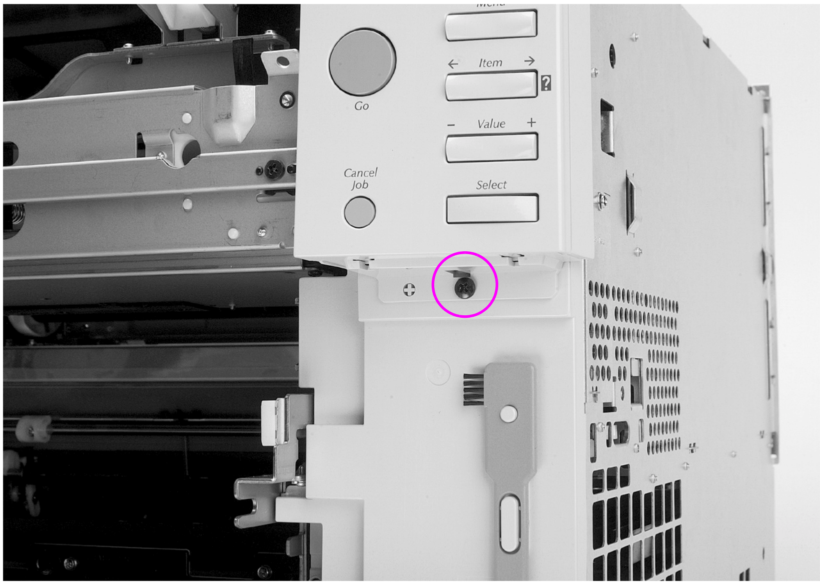


Figure 6-11 **Control panel removal and replacement**

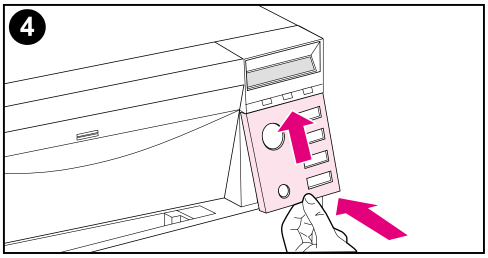
Installing or changing the control panel overlay

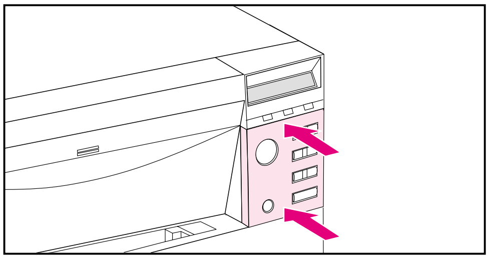
You might need to install the control panel overlay or replace the English overlay with one that displays your language. You also might need to configure the control panel to display messages in your language.

1. Locate the control panel overlay that came in the printer box and remove it from the bag.

   If you are installing an overlay, rather than replacing one, skip to step 4. Otherwise continue to step 2.
2. Gently lift out on both sides of the overlay that is currently installed on the printer.
3. Grasp the bottom of the overlay, pull it down, and then lift it out.

Note When removing the control panel overlay, you might want to use a small flat-blade screw driver to gently pry off the control panel overlay.





4. To install the new overlay, position it over the control panel and install the top side first. Insert the top tabs on the overlay into the slots on the printer face. Then push the overlay up and push in the bottom.
5. Snap the overlay firmly onto the control panel.

Front right cover

To remove the front right cover

1. Remove Tray 2.
2. Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

3. Open the ITB drawer (middle drawer).
4. Remove the control panel.
5. Remove the three screws as shown in callout 1, Figure 6-12.
6. Using a small flat-blade screwdriver, release the two plastic tabs (callout 2, Figure 6-12).
7. Remove the cover.

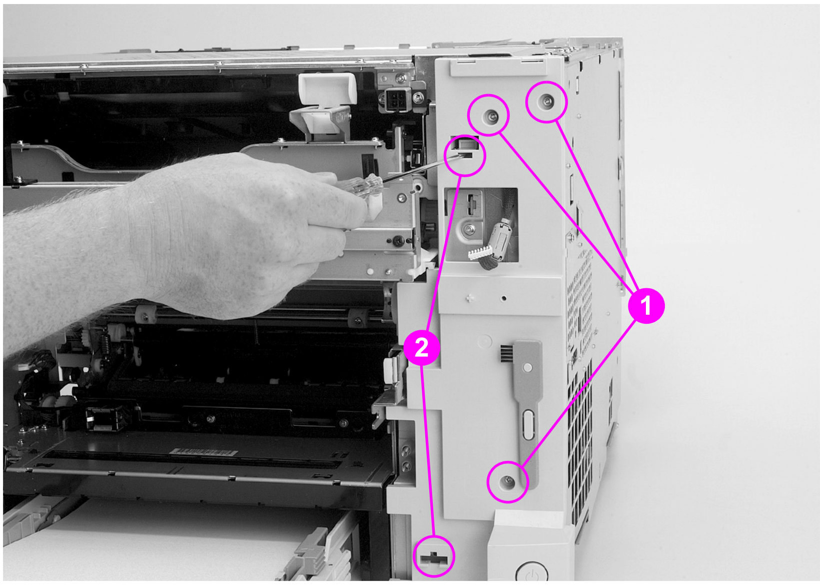


Figure 6-12 **Front right cover removal and replacement**

Radio Frequency Interference (RFI) shield

To remove the RFI shield

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the 13 screws shown in Figure 6-13.
4. Lift up on the RFI shield and remove.

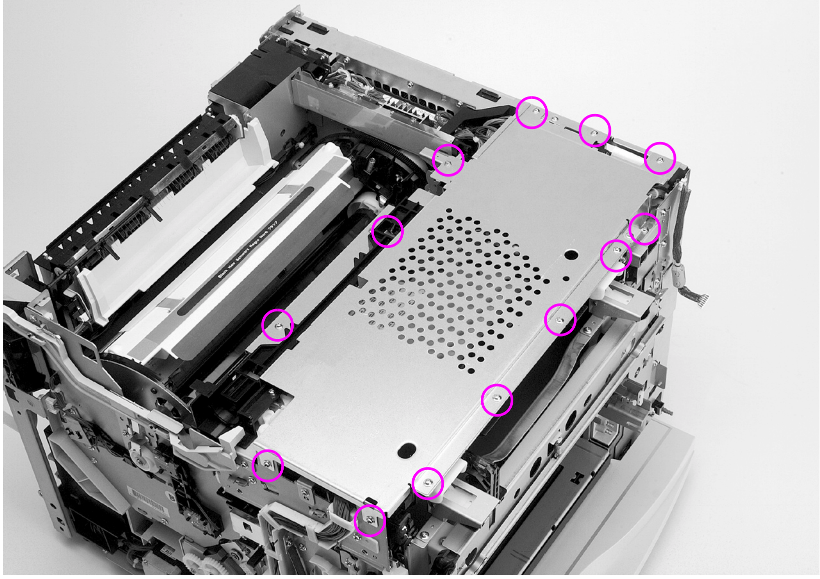


Figure 6-13 **RFI shield removal and replacement**

Laser/scanner assembly

To remove the laser/scanner assembly

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the RFI shield.
4. Disconnect the cable from the laser/scanner to the DC controller (J1006 on the DC controller). See callout 1, Figure 7-37 on page 317.
5. Free the cable harness from the two cable stays shown below in callout 1.
6. Disconnect the flat ribbon cable and the other cable from the laser/scanner PCB.
7. Remove the four long brass screws shown in callout 2.
8. Tilt the narrow end of the laser/scanner assembly up, pull it toward you, and lift slightly to remove it.

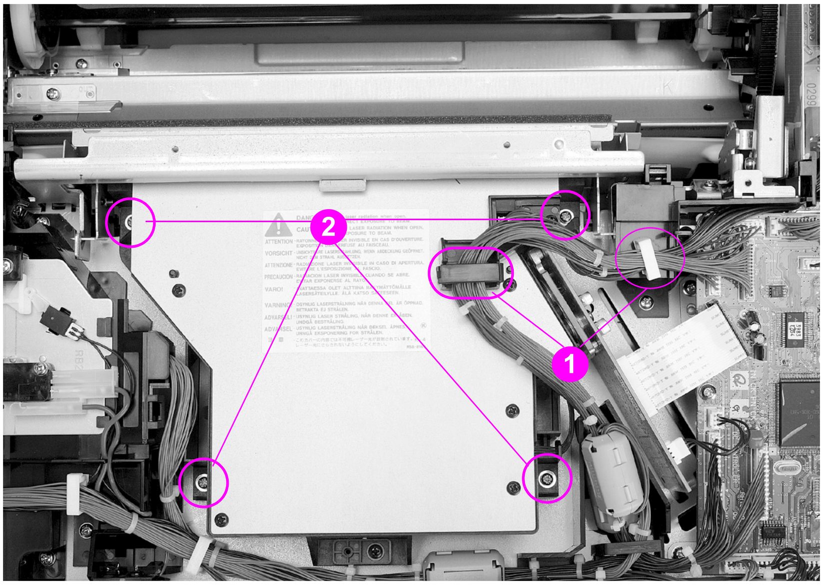


Figure 6-14 Laser/scanner assembly removal and replacement

DC controller

To remove the DC controller

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the RFI shield.
4. Disconnect all connectors from the DC controller, including the two ribbon cables.
5. Remove the five screws from the DC controller shown in Figure 6-15.
6. Lift the DC controller up and out to remove.

DC controller replacement tip

The connectors are keyed and will fit in only one slot.

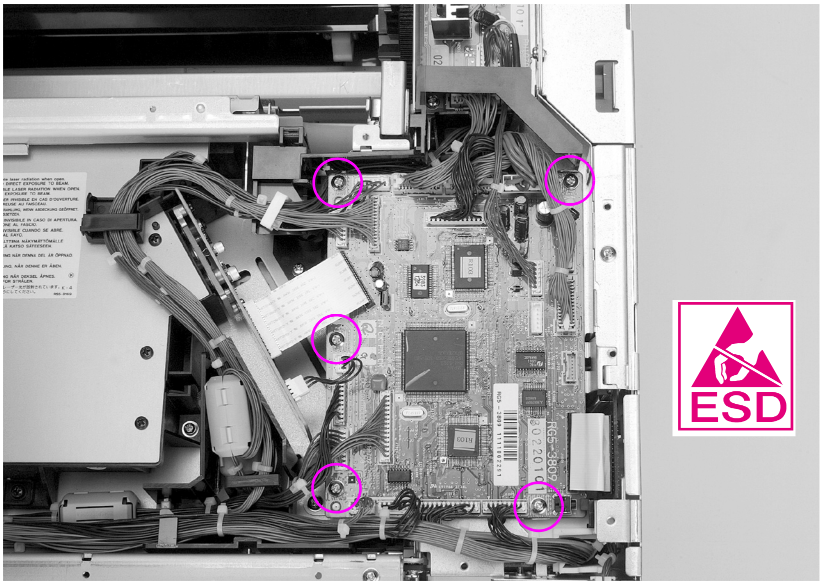


Figure 6-15 **DC controller removal and replacement**

Developing PCB

To remove the developing PCB

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the RFI shield.
4. Remove the plastic shield (callout 1, Figure 6-16) by releasing the two tabs shown (callout 2, Figure 6-16). If necessary, insert a flatblade screwdriver between the shield and the frame to release the tab.
5. Lift up on the shield to remove it.

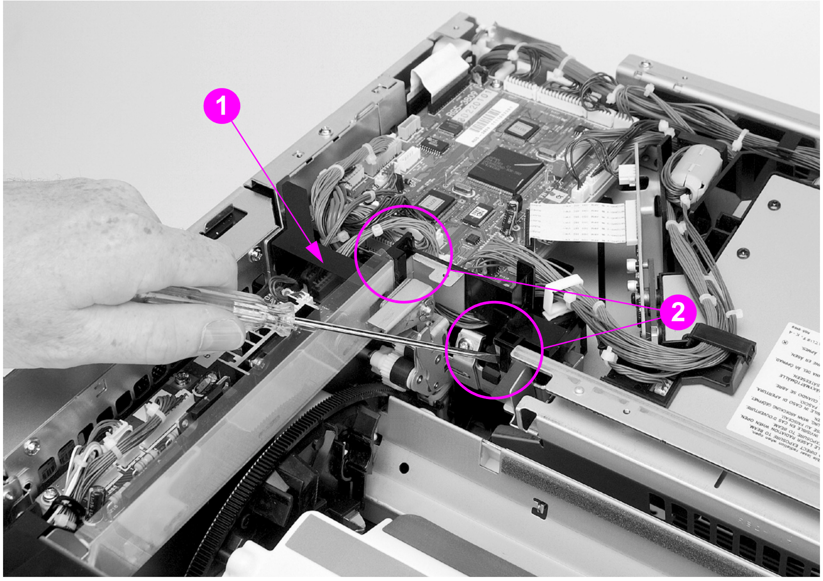


Figure 6-16 **Developing PCB removal and replacement (1 of 2)**

6. Disconnect the connectors from the developing PCB and release the cables from the metal cable stay (callout 2, Figure 6-17 on page 160).
7. Remove the five or four screws (depending on the version of printer that is being serviced) from the developing PCB (callout 1, Figure 6-17 on page 160).
8. Lift the developing PCB up and out.

Reinstallation tip

When securing the developing PCB with the five or four screws, secure the metal cable stay (callout 2, Figure 6-17) at the location shown.

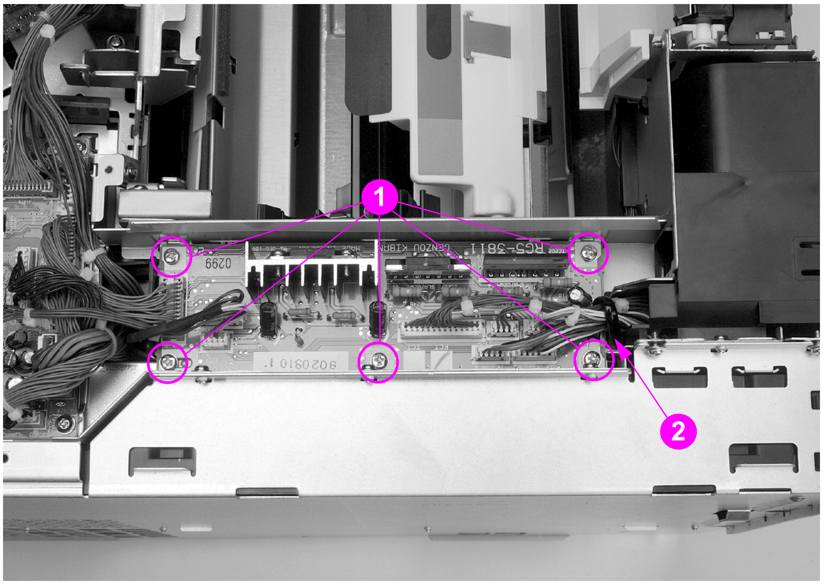


Figure 6-17 Developing PCB removal and replacement (2 of 2)

Top cover switch assembly

Note Turn the printer off, wait five seconds, and then unplug the printer.

Two versions of the HP Color LaserJet 4500 series printers are available. To identify which printer version you are servicing, see page 140.

To remove the top cover switch assembly

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the RFI shield.
4. Disconnect the sensor and switch cables from the top cover switch assembly (callout 1, Figure 6-18 on page 162).
5. Follow the instructions below, depending on the version of printer that is being serviced.

For HP Color LaserJet 4500 printer serial numbers xx*G* or lower:

1. Free the sensor and switch cables from their cable stays.
2. Remove the two screws from the top cover switch assembly (callout 2, Figure 6-18 on page 162).
3. Slide the switch assembly to the left side of the printer, and then lift it up and out.

For printer HP Color LaserJet 4500 serial numbers xx*H* or higher and HP Color LaserJet 4550 printers:

1. Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2. Free the cables from the five cable stays (callout 3, Figure 6-18 on page 162).
3. Remove the two screws that secure the switch assembly and lower cable guide to the printer frame (callout 1, Figure 6-19 on page 162).
4. Pull the rear door switch arm toward the front of the printer while lifting the switch assembly up and out slightly, taking care not to damage the cable guide.
5. Release the five plastic retaining clips securing the switch assembly to the lower cable guide to remove the switch assembly.

Replacement tip

When replacing the top cover switch assembly, make sure the cable is lying flat in the cable guide. Secure the two tabs on the right side of the switch assembly/cable guide before snapping the three tabs in place on the left side of the assembly.

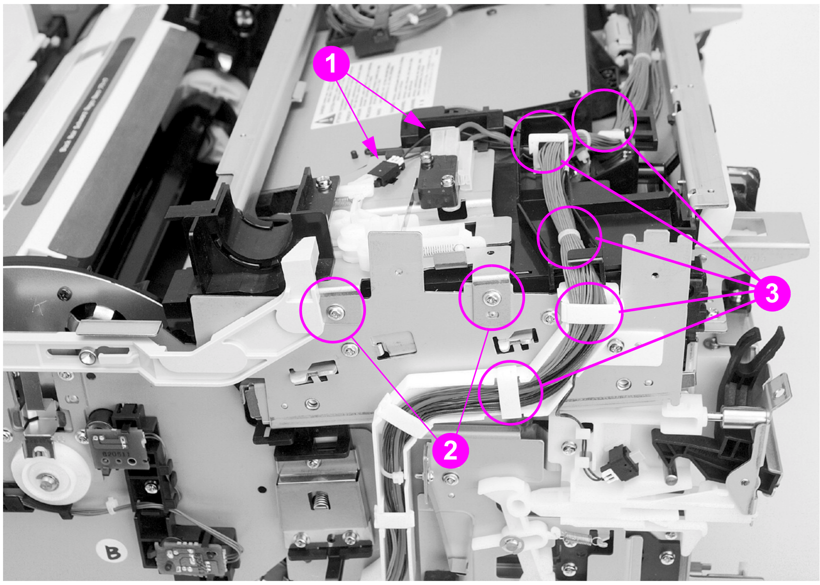


Figure 6-18 Top cover switch assembly removal and replacement

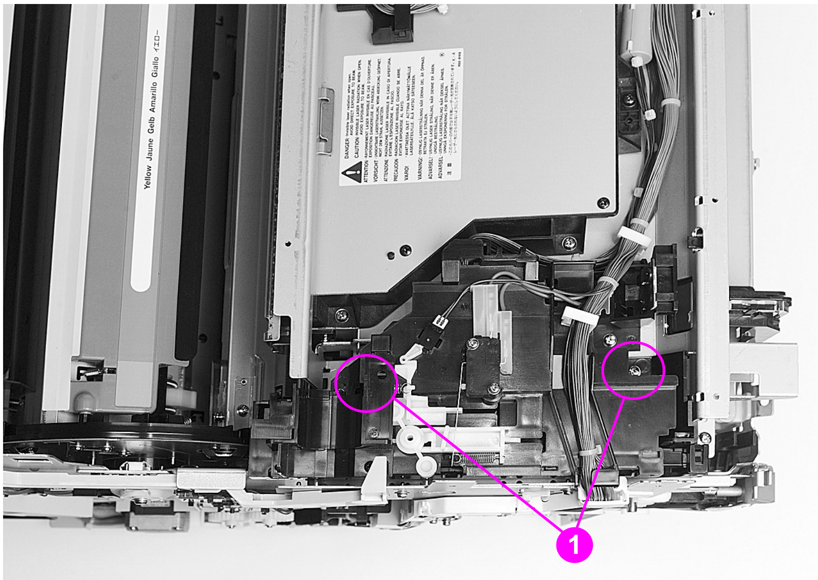


Figure 6-19 Top cover switch assembly removal and replacement

Drum drawer (top drawer) assembly

To remove the drum drawer (top drawer)

Note Turn the printer off, wait five seconds, and then unplug the printer.

1 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2 Remove the top cover.

3 Remove the left side cover.

4 Remove the RFI shield.

5 For printer serial numbers xxG or lower, remove the top cover switch assembly.

6 Disconnect connectors J1004 and J1010 on the DC controller (see callouts 2 and 3 in Figure 7-37 on page 317) and remove the cables from the cable stays.

7 Disconnect the drum drawer (top drawer) switch (see callout 1, Figure 6-20).

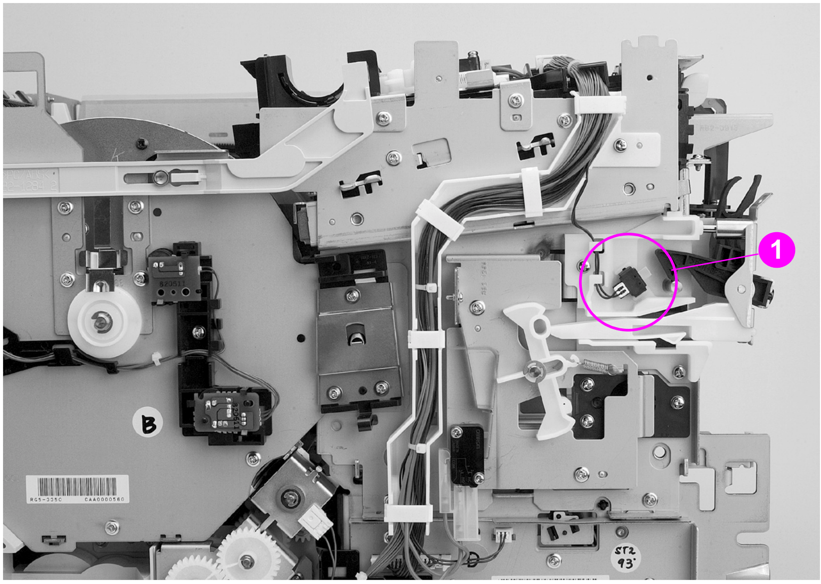


Figure 6-20 **Drum drawer (top drawer) switch**

8 Free the main cable from all cable stays at the top and left side of the printer; push the cables back toward the rear of the printer.

9 Remove the two screws from the black plastic housing shown in callout 1, Figure 6-21.

10 Lift the black plastic housing and slide it forward onto the front drawer.

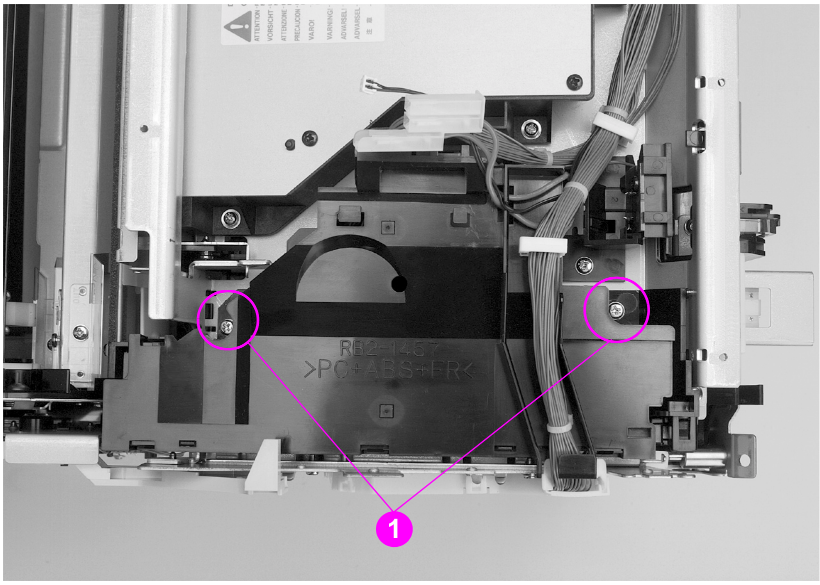


Figure 6-21 **Drum drawer (top drawer) assembly removal and replacement (1 of 3)**

11 Slide a small flat-blade screwdriver under the black plastic retaining clips on the drawer guide rails. Then lift the tab and pull the drawer out slightly to clear the latch that holds the plastic retaining clips in place (see Figure 6-22 and Figure 6-23).

12 Pull the drum drawer (top drawer) straight out and away from the printer.

Reinstallation tip

When replacing the drum drawer (top drawer) assembly, make sure the cable is lying flat in the cable guide.

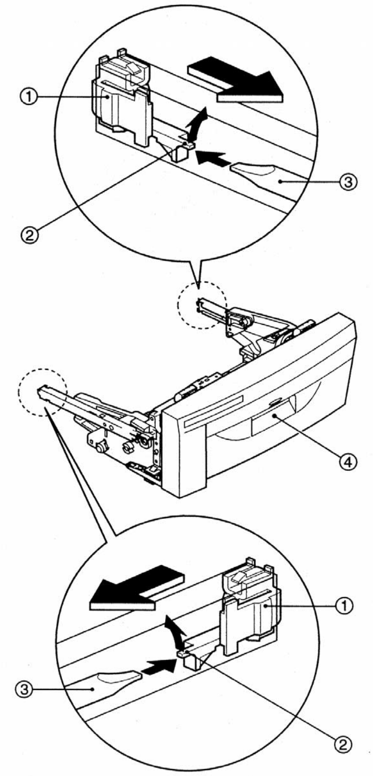


Figure 6-22 Drum drawer (top drawer) assembly removal and replacement (2 of 3)

The following graphic shows an alternative method of removing the left side of the drum drawer.

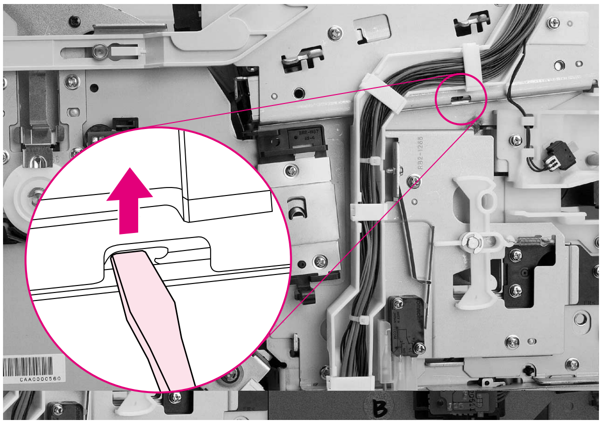


Figure 6-23 Drum drawer assembly removal and replacement (3 of 3)

Densitometer assembly

To remove the densitometer

Note Turn the printer off, wait five seconds, and then unplug the printer.

1 Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2 Remove the two screws on the densitometer as shown in callout 1, Figure 6-24, and move the assembly slightly to the rear.

3 Use a small, flat-blade screwdriver to release the tab shown in callout 2, Figure 6-24, and remove the metal shield over the densitometer.

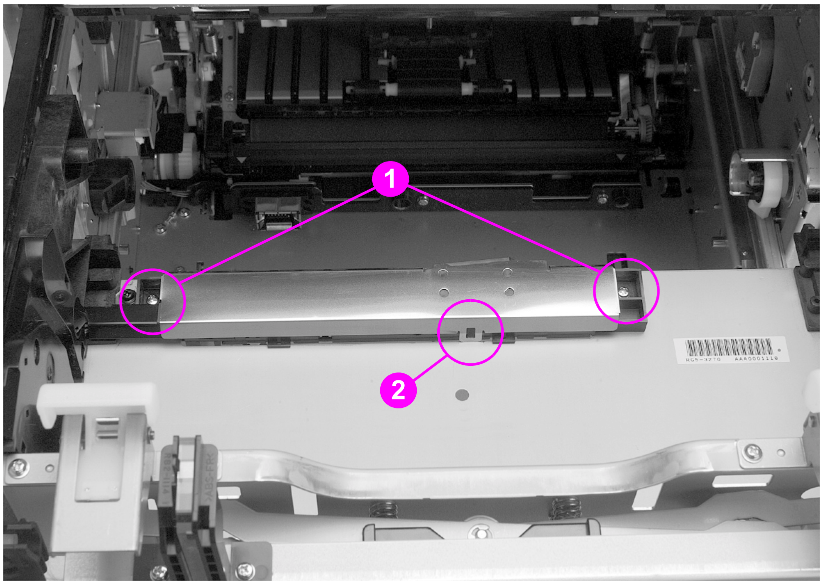


Figure 6-24 **Densitometer removal and replacement (1 of 2)**

4 Remove the plastic cable cover as shown in Figure 6-25.

5 Remove the cable from the cable stays, and then disconnect the connector from the densitometer.

6 Remove the densitometer by sliding it toward the rear of the printer.

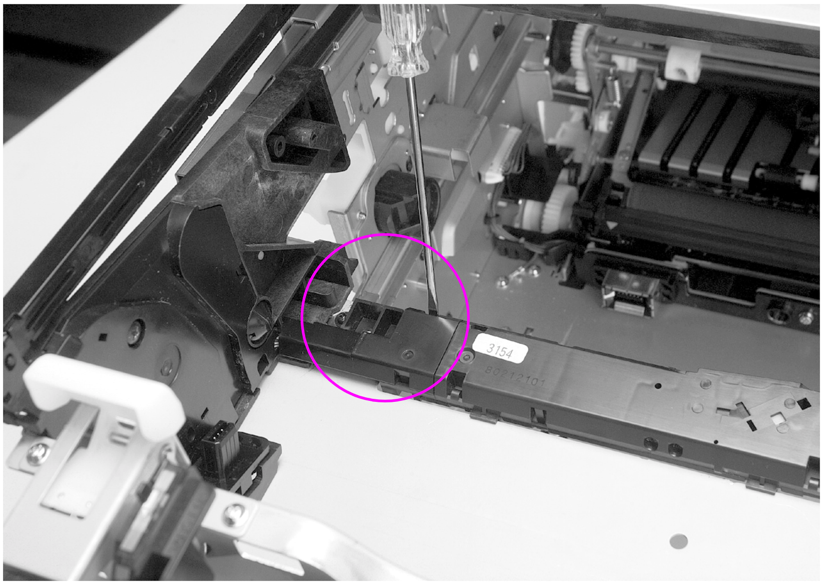


Figure 6-25 Densitometer removal and replacement (2 of 2)

Right side assemblies

Formatter

To remove the formatter

1. Turn off the printer.
2. When the fans are turned off, unplug the printer.

CAUTION Power is applied to the formatter as long as the printer is plugged in. Removing the formatter while power is supplied to the printer can damage the formatter.

3. Remove the six screws in the formatter shown in Figure 6-26.
4. Slide the formatter out of the rear of the printer.

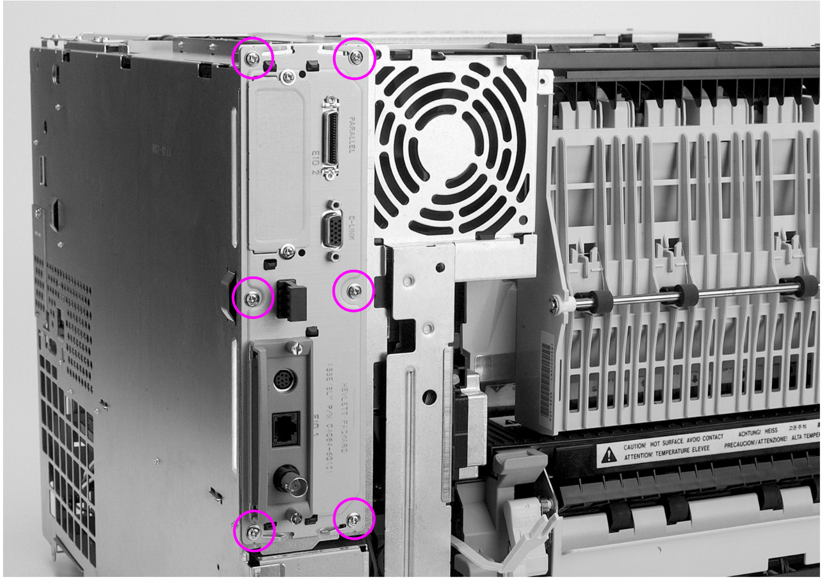


Figure 6-26 **Formatter removal and replacement**

Note The HP Color LaserJet 4550 printer formatter looks different externally, but the removal procedure is the same as for the HP Color LaserJet 4500 printer.

Formatter PCB

To remove the formatter PCB from the cradle

Note Turn the printer off, wait five seconds, and then unplug the printer.

Before replacing the formatter or firmware, make sure to record the printer’s serial number, fuser maintenance count, transfer maintenance count, color page count, and total page count.

1. Remove the formatter from the printer by removing the six screws.
2. Remove the EIO cards (if any) from the EIO slots.
3. Disconnect the L-shaped (I/O) card from the formatter by lifting up on the narrow end of the PCB.
4. While lifting the two black plastic tabs located over the EIO connectors on the formatter PCB, slide the formatter PCB out of the cradle.

Note Lift the narrow end of the L-shaped (I/O) card so the connectors have clearance.

5. Install the new formatter PCB by sliding it into the cradle.
6. Reconnect the L-shaped (I/O) card to the formatter PCB.
7. Pull all DIMMs from the old formatter PCB and install them on the new formatter PCB, making sure the firmware DIMM is installed in the ROM ONLY DIMM slot of the HP Color LaserJet 4500 printer, or Slot #3 (J7) of the HP Color LaserJet 4550 printer.
8. Install the EIO cards (if any).
9. Install the formatter back into the printer.
10. Power up the printer in NVRAM initialization mode as follows:
    - Step 1 Hold down both the [CANCEL JOB] and [SELECT] keys until all the LED lights are on, then release the keys.
    - Step 2 Press [CANCEL JOB].
    - Step 3 Press [SELECT].
11. Once initialization is complete, turn off the printer, then turn it back on in service mode (see “Service mode” on page 293 for more information).
12. Enter the printer’s serial number, fuser maintenance count, transfer maintenance count, color page count, and total page count.
13. Print a configuration page to verify printer operation.

Formatter pan assembly

To remove the formatter pan assembly

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Open the drum drawer (top drawer) until it stops and remove the imaging drum, protecting it from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2. Open the ITB drawer (middle drawer) and Tray 2.
3. Remove the top cover.
4. Remove the right side cover.
5. Remove the right rear cover.
6. Remove the left side cover.
7. Remove the RFI shield.
8. Remove the control panel.
9. Remove the front right cover.
10. Remove the two screws for the connector cover shown in Figure 6-27.

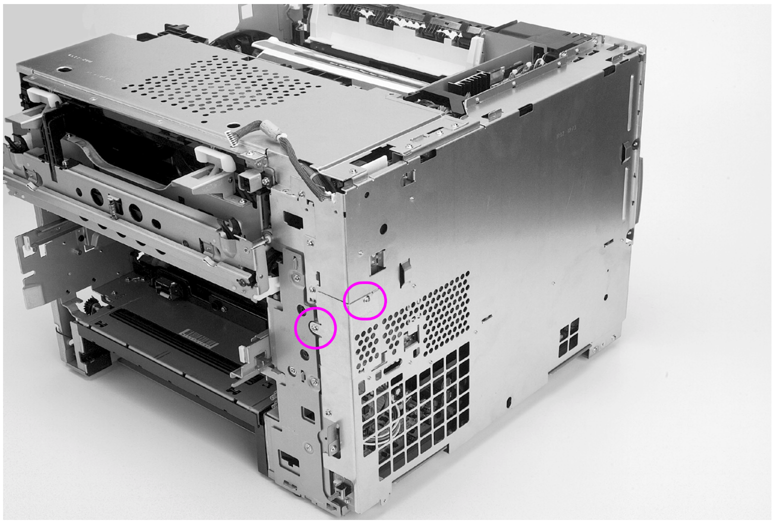


Figure 6-27 **Formatter pan assembly removal and replacement (1 of 4)**

11. Disconnect the two connectors shown in callout 1, Figure 6-28.

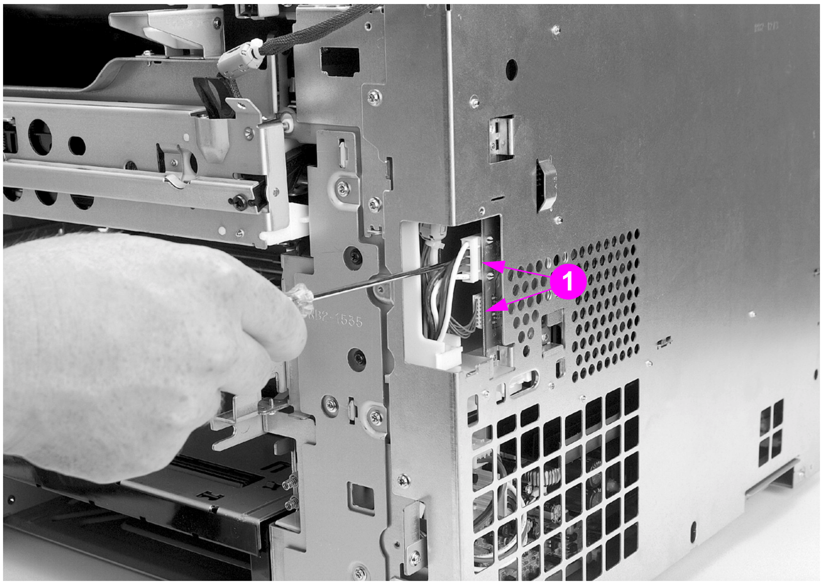


Figure 6-28 Formatter pan assembly removal and replacement (2 of 4)

CAUTION A small, flat-blade screwdriver should be used to release the top connector by pressing on the latch. Failure to use a flat-blade screwdriver to press on the latch will damage the connector.

12 Disconnect the ribbon cable from the DC controller shown in callout 1, Figure 6-29.

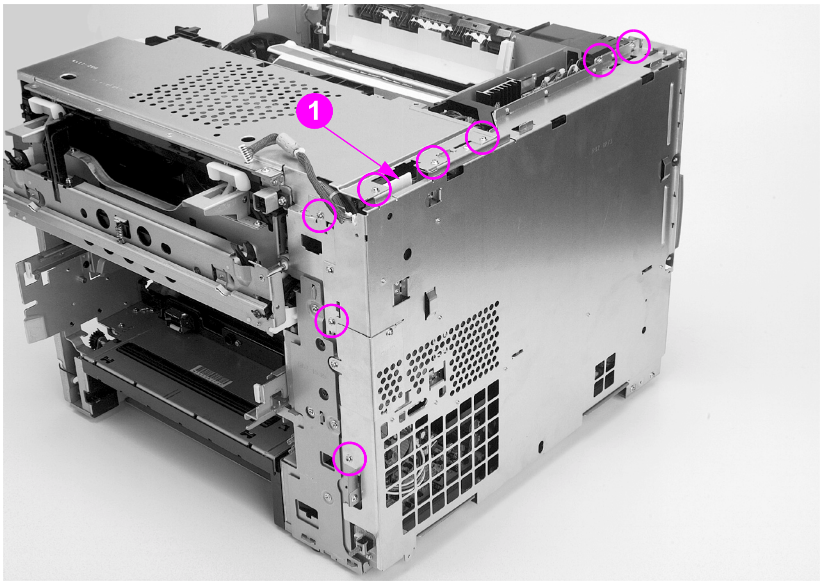


Figure 6-29 Formatter pan assembly removal and replacement (3 of 4)

Note Although Figure 6-29 depicts the RFI shield still installed, make sure this shield was removed at step 7.

13 Remove the control panel cable from its cable stay, if necessary.

14 Remove the screws from the formatter pan assembly (shown in Figure 6-29 and Figure 6-30).

15 To remove the formatter pan, lift it slightly while pulling it out so that it clears the tabs.

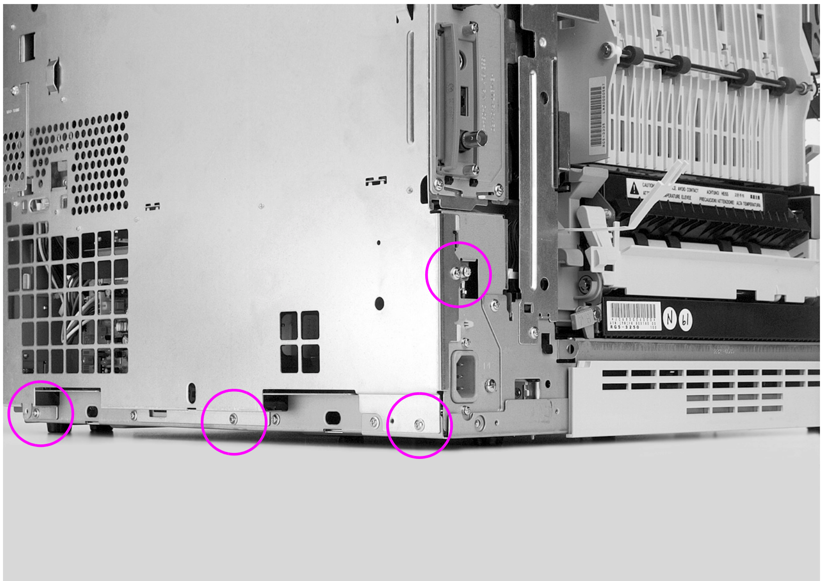


Figure 6-30 Formatter pan assembly removal and replacement (4 of 4)

Reinstallation tip

- Be sure the four tabs (two on the top and one each on the rear and front of the formatter pan assembly) are engaged prior to tightening the screws.
- Be sure to reconnect the ribbon cable from the DC controller shown in callout 1, Figure 6-29.

Power supply

To remove the power supply

Note Turn the printer off, wait five seconds, and then unplug the printer.

Two versions of the HP Color LaserJet 4500 series printers are available; the later version is equivalent to the HP Color LaserJet 4550 unless otherwise noted. To identify which printer version you are servicing, see page 140.

1. Remove the formatter pan assembly.
2. Disconnect the four connectors (three in front and one in top rear of printer) from the power supply.
3. Free the cable harness from the cable stay.
4. Remove the four or seven screws (depending on the version of printer you are working on) from the power supply shown in Figure 6-31.
5. Slide the power supply forward slightly to clear the rear retaining tab and tilt the top of the assembly out. Lift the power supply up and out.

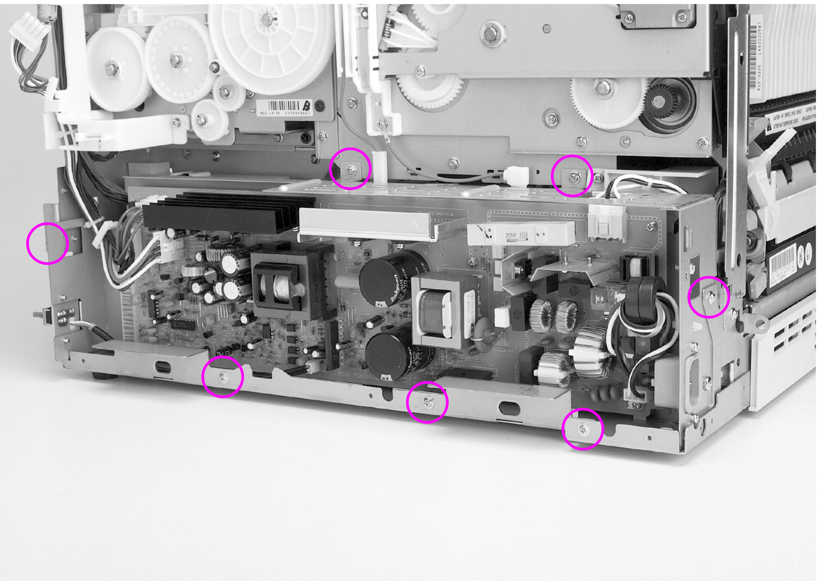


Figure 6-31 Power supply removal and replacement

High-voltage power supply

To remove the high-voltage power supply (HVPS)

Note Turn the printer off, wait five seconds, and then unplug the printer.

Two versions of the HP Color LaserJet 4500 series printers are available; the newer version is equivalent to the HP Color LaserJet 4550 unless otherwise noted. To identify which printer version you are servicing, see page 140.

1. Remove the formatter pan assembly.
2. Remove the power supply.

Note Some printers have a cover over the high-voltage power supply.

3. Remove the rear door.
4. Remove the fusing assembly.
5. Disconnect the four cables from their connectors (callout 1, Figure 6-32 or callout 1, Figure 6-33, depending on the version of printer being serviced).
6. Free the cable harness from the cable stays.
7. Remove the four brass screws shown in callout 2, Figure 6-32 from the HVPS.
8. Carefully pull the HVPS out. Ensure that the rear plastic retaining strap attached to the HVPS clears the chassis and its remaining components.

High-voltage power supply replacement tip

When reinstalling the HVPS, carefully insert the plastic retaining strap attached to the rear of the HVPS through the chassis.

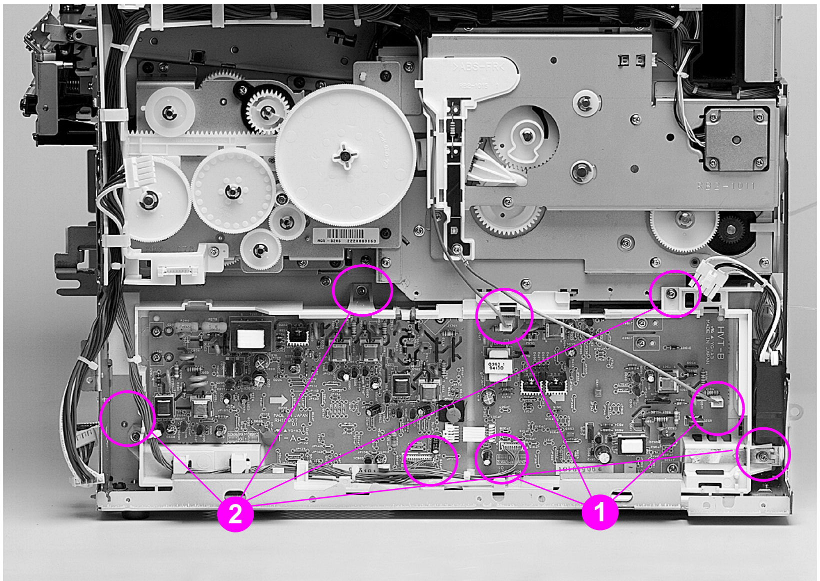


Figure 6-32 **High-voltage power supply removal and replacement (newer version HP Color LaserJet 4500 and HP Color LaserJet 4550 printers)**

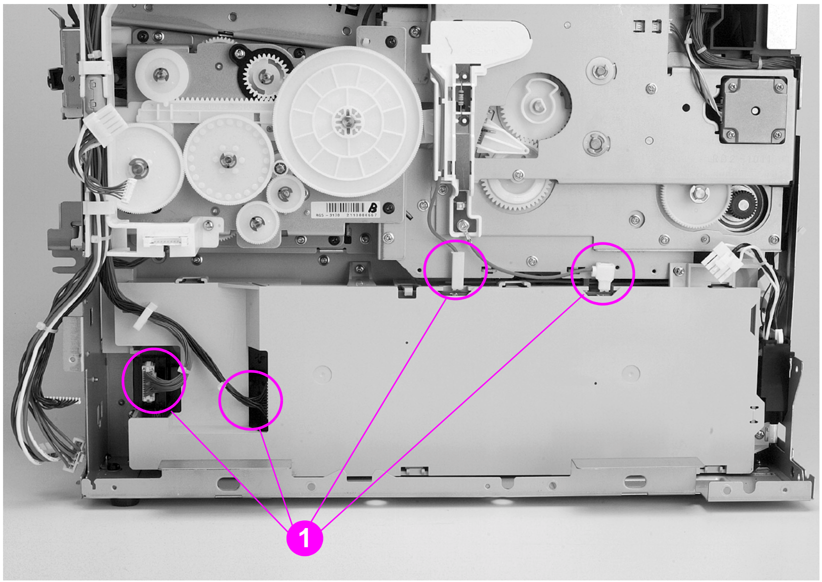


Figure 6-33 **High-voltage power supply removal and replacement (older version HP Color LaserJet 4500 printers)**

Drum drive assembly

To remove the drum drive assembly

Note Turn the printer off, wait five seconds, and then unplug the printer.

1 Open both front drawers.

CAUTION Make sure the imaging drum is protected from light. Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2 Remove the formatter pan assembly.

3 Remove the power supply.

4 Disconnect the two cables from the HVPS and free them from the cable stay.

5 Remove the screw that secures the cable trough to the drum drive assembly as shown in Figure 6-34.

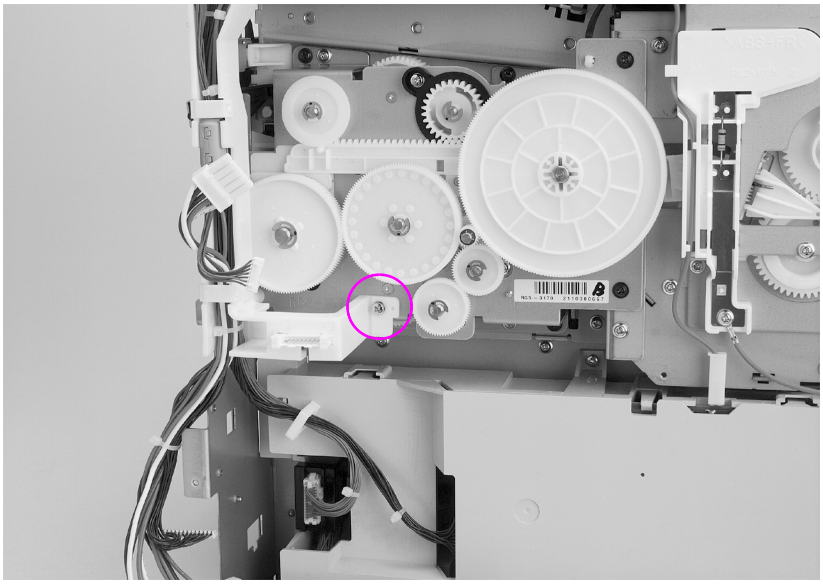


Figure 6-34 **Drum drive assembly removal and replacement (1 of 3)**

6 Carefully release the cable trough by pulling out slightly on the bottom and releasing the clip. Depress the plastic v-shaped clip underneath the DC controller to loosen the cable guide. Slide the trough toward the rear of the printer until it is free.

7 Disconnect J204 on the developing PCB and free it from its cable stay.

8 Remove the eight black screws from the drum drive assembly shown in Figures 6-35 and 6-36.

9 Gently slide the drum drive assembly straight out from the printer assembly taking care not to damage the cable.

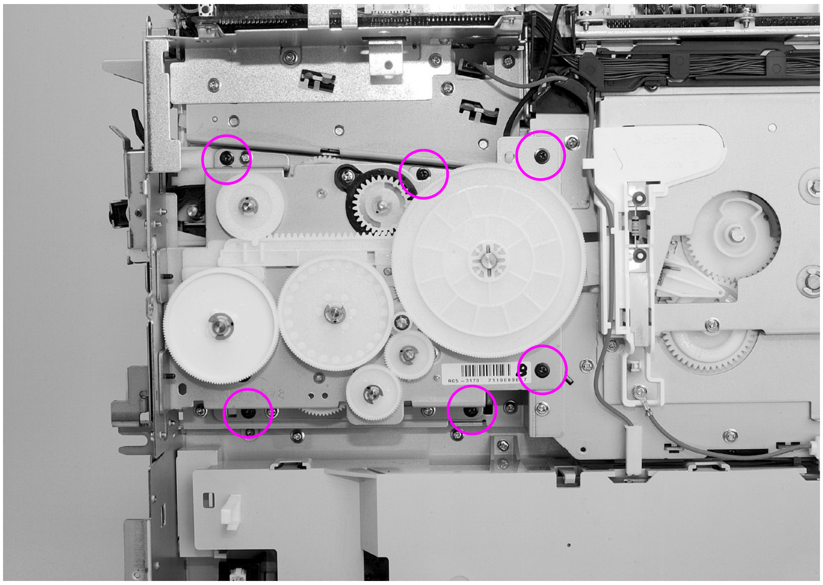


Figure 6-35 Drum drive assembly removal and replacement (2 of 3)

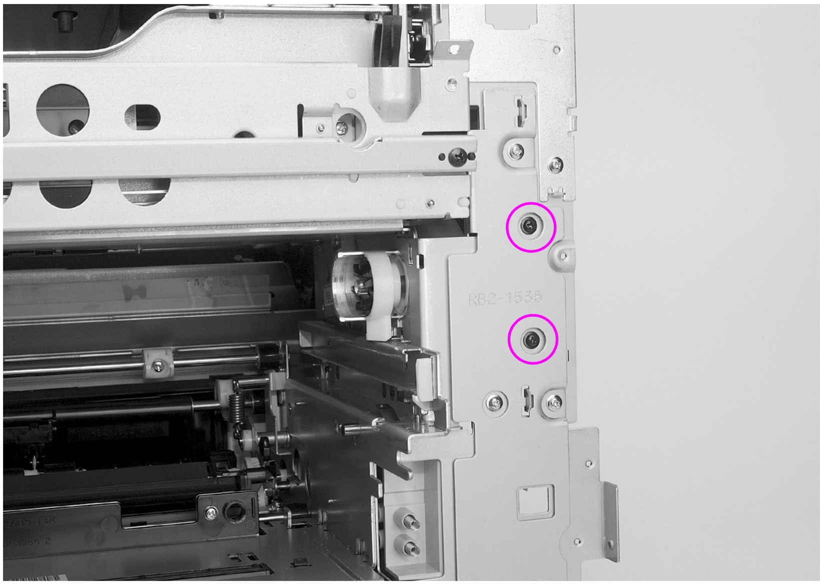


Figure 6-36 Drum drive assembly removal and replacement (3 of 3)

Large fan housing

To remove the large fan housing

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the formatter pan assembly.
2. Remove the four screws shown in Figures 6-37 and 6-38 (callout 1) from the large fan housing.
3. Remove the large fan housing.

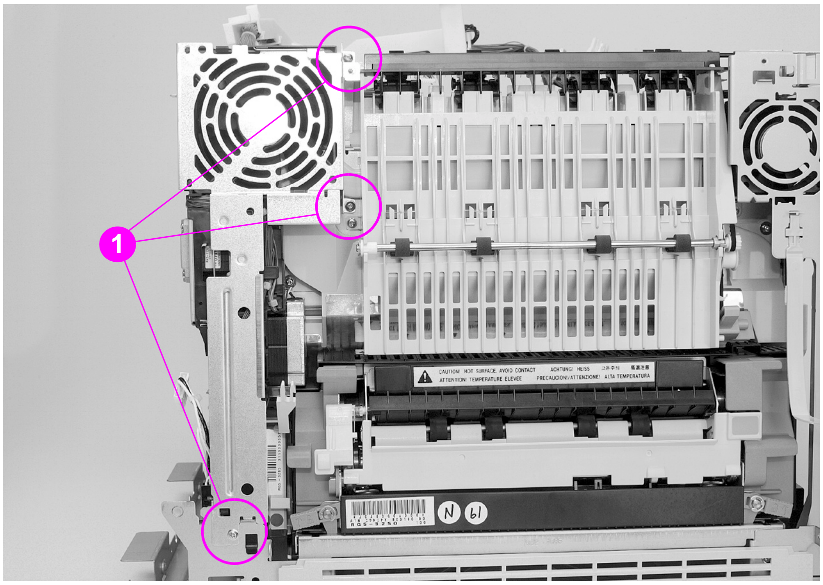


Figure 6-37 **Large fan removal and replacement (1 of 2)**

4. Disconnect connector J209 on the developing PCB and free the cable from its cable stays.
5. Unweave the cable from the cable trough to remove it.
6. Remove the screw from the right rear fan housing shown in callout 2.

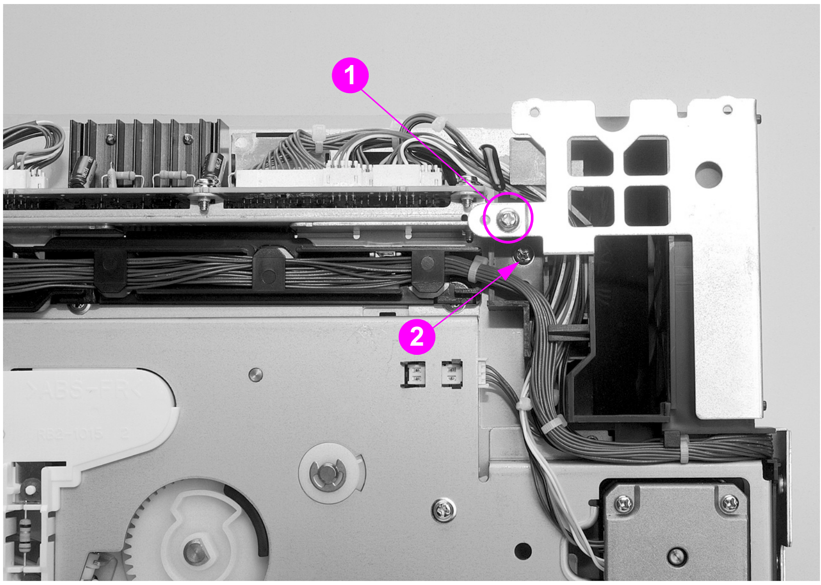


Figure 6-38 **Large fan removal and replacement (2 of 2)**

Carousel drive assembly

To remove the carousel drive assembly

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the formatter pan assembly.
2. Remove the rear door.
3. Remove the large fan housing and the fan.
4. Remove the toner level sensing assembly from the HP Color LaserJet 4550 (see Figure 6-39).

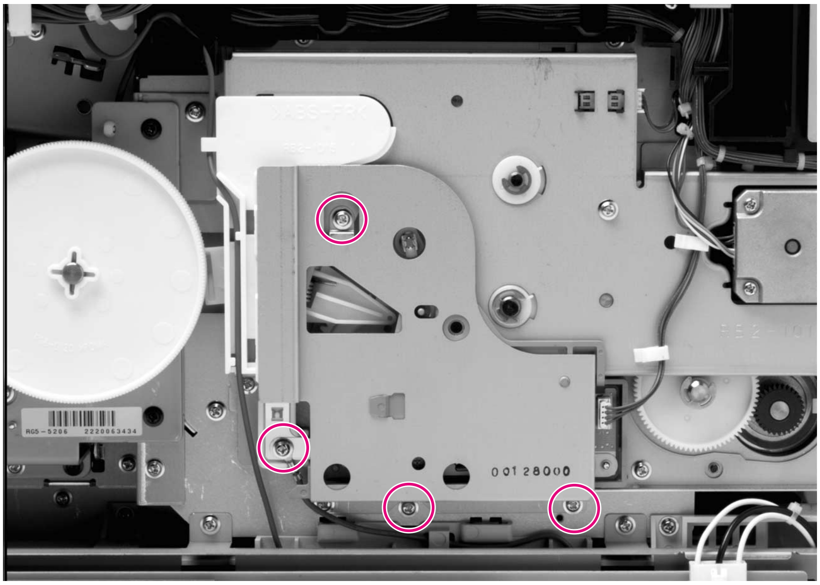


Figure 6-39 **Toner level sensor assembly removal and replacement**

5. Free the cables from the rear cable trough located beneath the large fan housing shown in callout 1.
6. Disconnect the two motor cables from their connectors (J203 and J205) located on the developing PCB and remove them from their trough.
7. Disconnect the sensor as shown in callout 2.
8. Disconnect the two high-voltage (red) cables from the HVPS and free the front cable from the cable stays.
9. Push up and out on the cable trough shown in callout 3 to release the lower tabs. Then tilt the bottom of the cable trough out slightly to gain access to the top screws on the carousel drive assembly.

Note To remove the cable trough, you might need to first loosen the screw on top of the developing PCB housing.

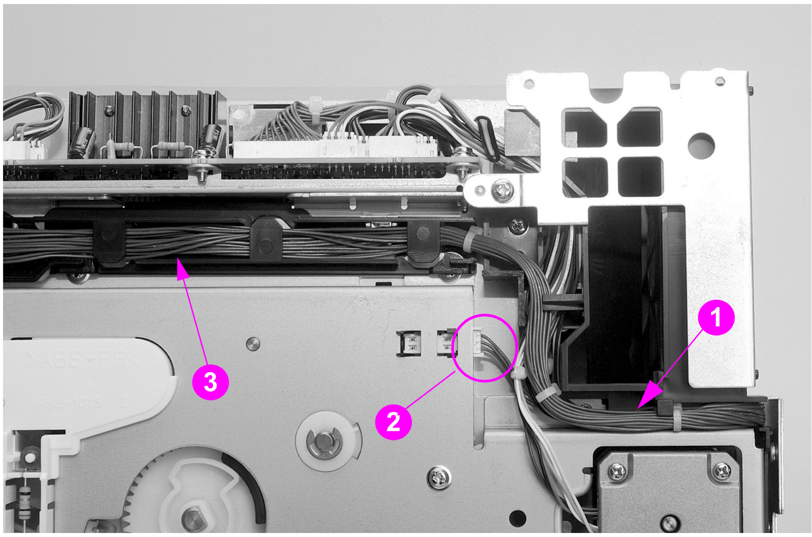


Figure 6-40 **Carousel drive assembly removal and replacement (1 of 2)**

10 Remove the four screws shown in Figure 6-41 from the carousel drive assembly.

11 Carefully remove the carousel drive assembly by pulling the assembly straight out.

CAUTION Be sure to reconnect the sensor cables (see Figure 6-40, callout 2)

Carousel drive assembly replacement tip

When replacing the carousel drive assembly, be sure to align the "D" shaped shaft with the "D" shaped hub located on the gear shown in the center of Figure 6-41.

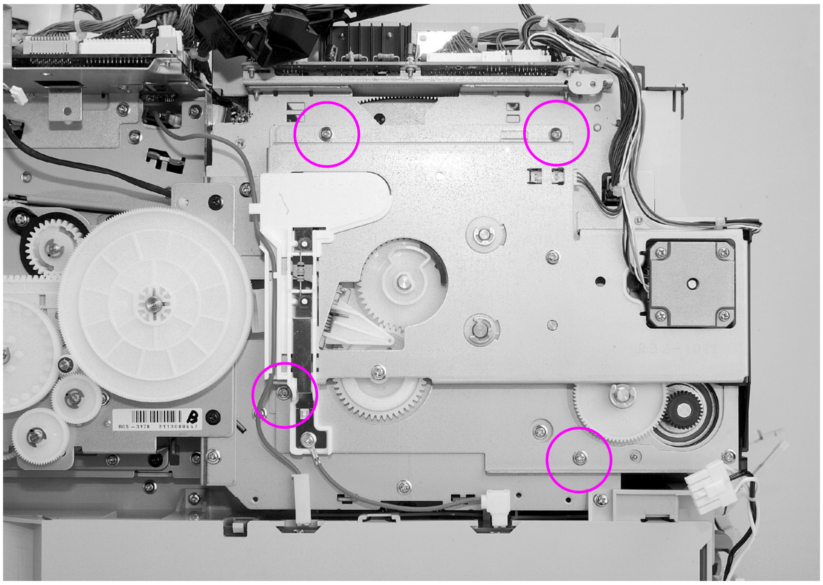


Figure 6-41 **Carousel drive assembly removal and replacement (2 of 2)**

Paper size switch PCB

To remove the paper size switch PCB

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Pull Tray 2 out.
2. Remove the high-voltage power supply.
3. Disconnect the connector as shown in callout 1.
4. Remove the black screw from the paper size switch PCB shown in callout 2. Remove the switch PCB.

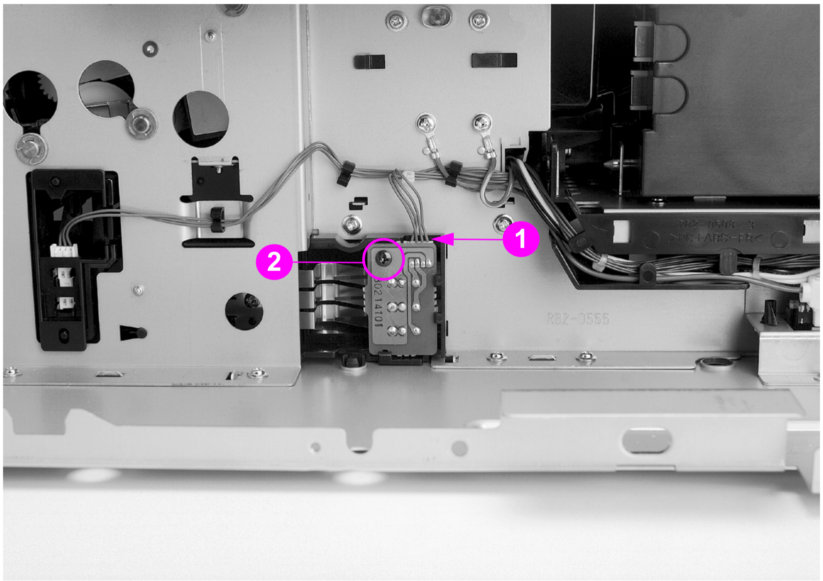


Figure 6-42 **Paper size switch removal and replacement**

Left side assemblies

Drawer switch assembly

To remove the drawer switch assembly

1. Remove the top cover.
2. Remove the left side cover.
3. Disconnect the connector shown in callout 1.
4. Remove the two screws from the drawer switch assembly shown in callout 2.
5. Pull the drawer switch assembly away from the chassis.

Replacement tip

Open both front drawers for easier installation.

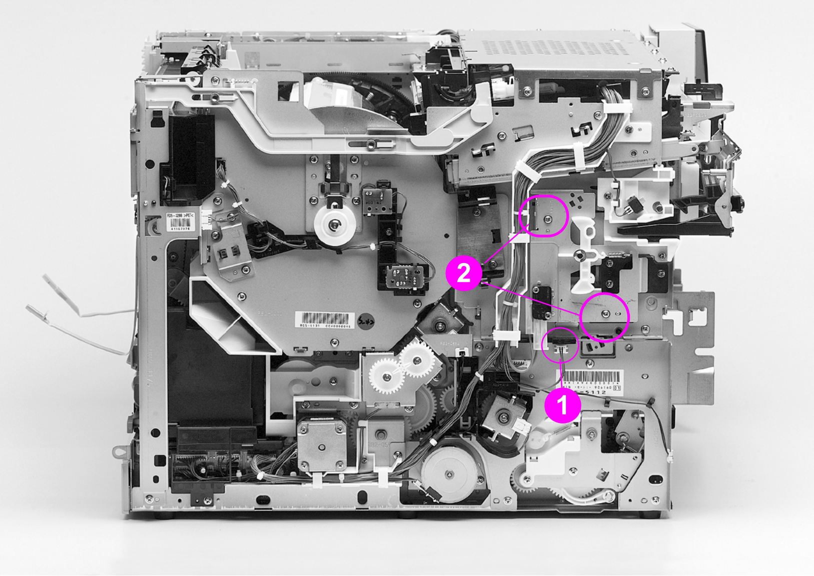


Figure 6-43 **Switch plate assembly removal and replacement**

Paper feed PCB

To remove the paper feed PCB

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the rear door.
4. Remove the fusing assembly.
5. Disconnect the small fan connector shown in callout 1.

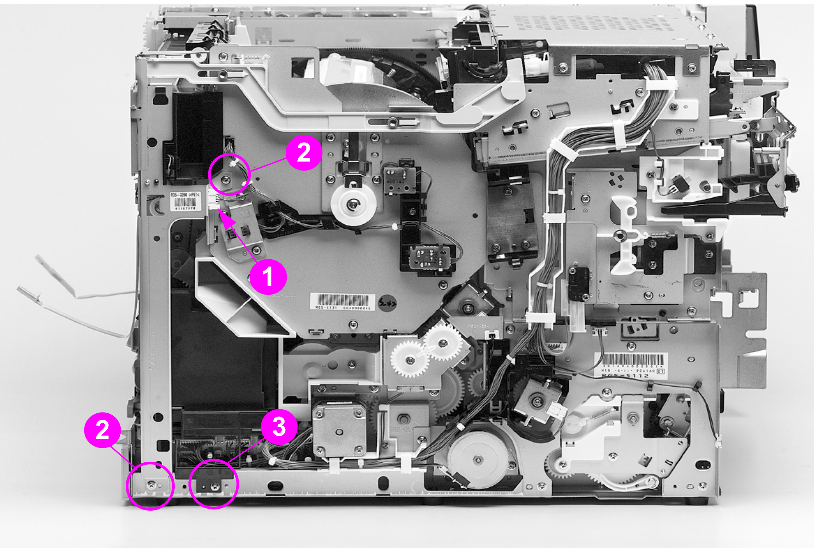


Figure 6-44 **Paper feed PCB removal and replacement (1 of 3)**

6. Remove the three screws from the left rear sheet metal fan shield shown in Figure 6-44 and Figure 6-45 (callout 2) and remove the shield.

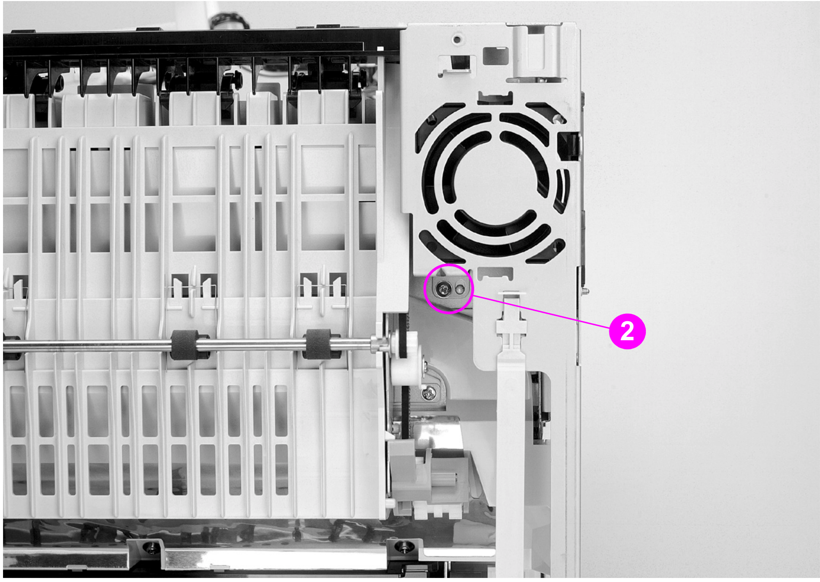


Figure 6-45 **Paper feed PCB removal and replacement (2 of 3)**

7. Remove the screw in the black plastic cover shown in callout 3, Figure 6-44.
8. Remove the black plastic cover.
9. Remove the eight cables from their connectors on the paper feed PCB shown in Figure 6-46.
10. Remove the screw from the rear of the paper feed PCB (callout 4, Figure 6-46).
11. Carefully remove the paper feed PCB by sliding the board backwards, then tilt the top of the board forward to clear the top of the board from the metal tab along the top of the PCB.

Paper feed PCB replacement tip

Carefully insert the paper feed PCB into the chassis, ensuring that the two paper feed PCB metal tabs sit in the open tab holders in the chassis.

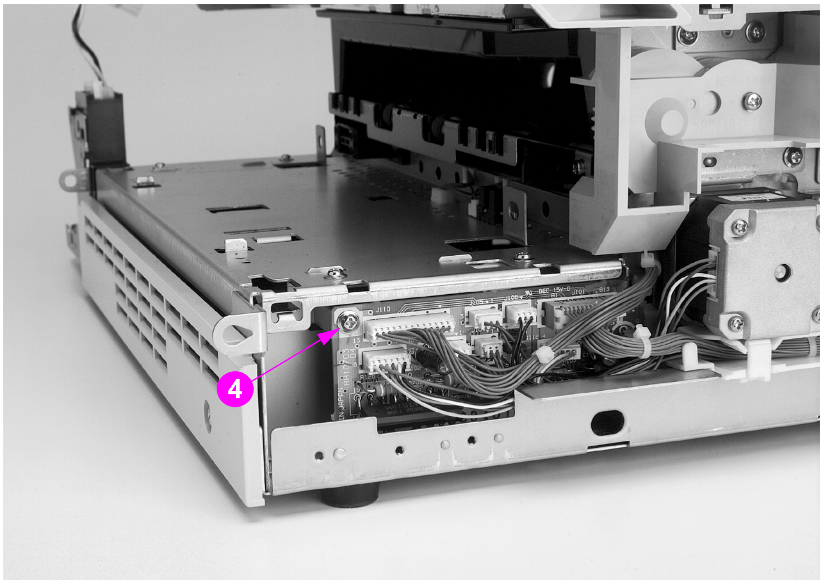


Figure 6-46 **Paper feed PCB removal and replacement (3 of 3)**

Fusing motor (M1)

To remove the fusing motor

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the fusing assembly.
4. Remove the screw shown in callout 1, and remove the black plastic piece.
5. Disconnect connector J102 from the paper feed PCB.
6. Remove the screw that secures the white cable trough to the chassis (callout 2).

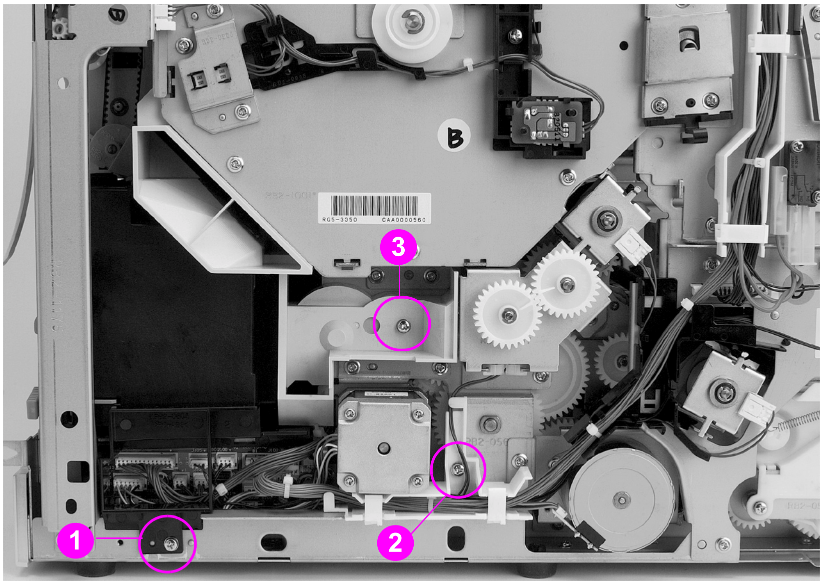


Figure 6-47 **Fuser motor removal and replacement (1 of 2)**

7. Slide the cable trough and cables out from the chassis.
8. Remove the screw securing the plastic gear cover, as shown in callout 3, and then remove the cover.
9. Remove the three fuser motor screws shown in Figure 6-48.
10. Carefully pull to remove the fuser motor and free the cable from the cable trough.

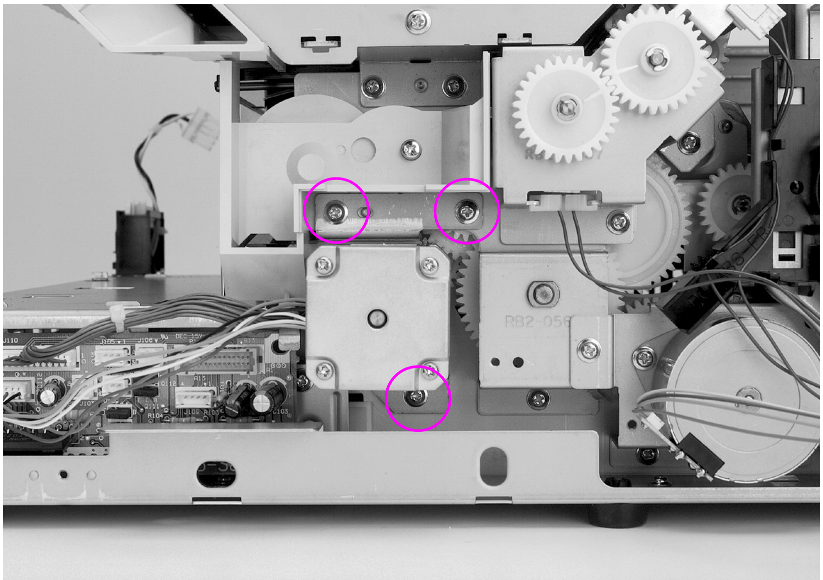


Figure 6-48 **Fuser motor removal and replacement (2 of 2)**

Paper path pick-up motor (M2)

Note Turn the printer off, wait five seconds, and then unplug the printer.

1. Remove the top cover.
2. Remove the left side cover.
3. Disconnect the paper path motor connector (J109) from the paper feed PCB and remove it from the cable trough.
4. Remove the two screws on both sides of the paper path motor shown in Figure 6-49.
5. Remove the paper path motor by sliding the motor back and then out to clear the gear on the motor.

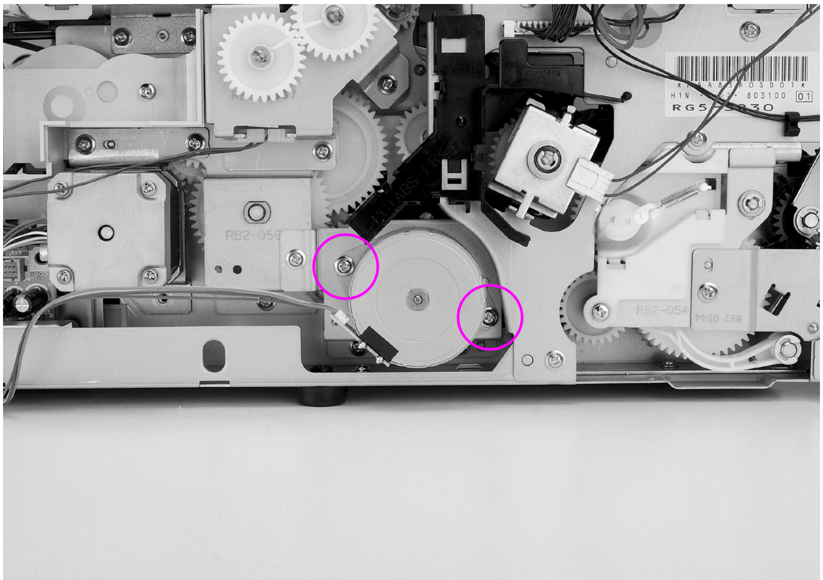


Figure 6-49 **Paper path motor removal and replacement**

Paper pick solenoid (SL2)

To remove the paper pick solenoid

1. Remove the top cover.
2. Remove the left side cover.
3. Disconnect the solenoid connector (J106) from the paper feed PCB, and free the cable from the cable stays. Note the cable path when removing the cable.
4. Remove the screw (callout 1) and e-clip (callout 2) that hold the solenoid assembly in place, and then remove the solenoid assembly. For HP Color LaserJet 4500 printers with serial numbers xxH or higher and HP Color LaserJet 4550 printers, also remove the screw shown in callout 3 to remove the solenoid assembly.

Replacement tip

CAUTION When reinstalling the solenoid assembly, make sure that the flat parts of the Tray 2 pickup rollers are down and that the plastic spring-loaded gear is fully engaged.

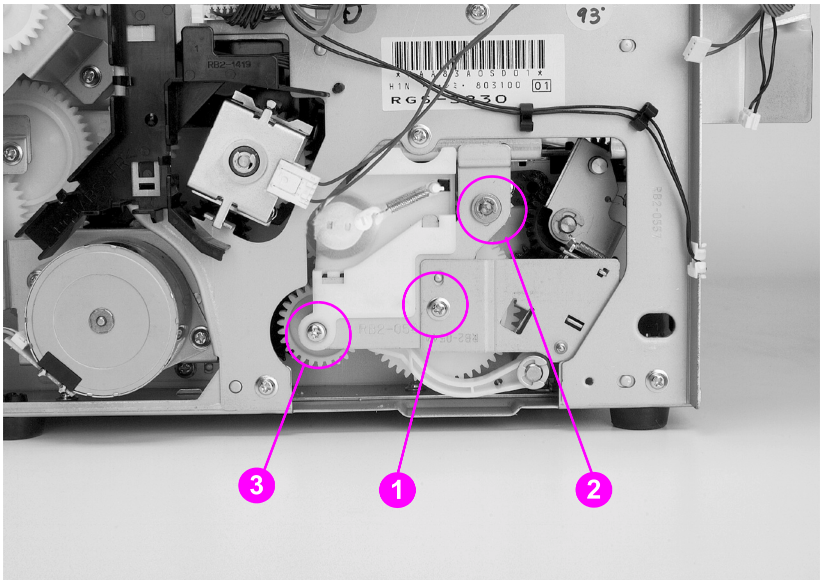


Figure 6-50 **Paper pick solenoid removal and replacement**

ITB cleaning roller clutch (CL3)

To remove the ITB cleaning roller clutch

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the screw securing the metal CL3 cover plate shown in callout 1, and remove the plate.
4. Unplug the connector from the cleaning roller clutch.
5. Using needle-nose pliers, remove the e-clip and the gear shown in callout 2.
6. Using needle-nose pliers, remove the e-clip and ITB cleaning roller clutch shown in callout 3.

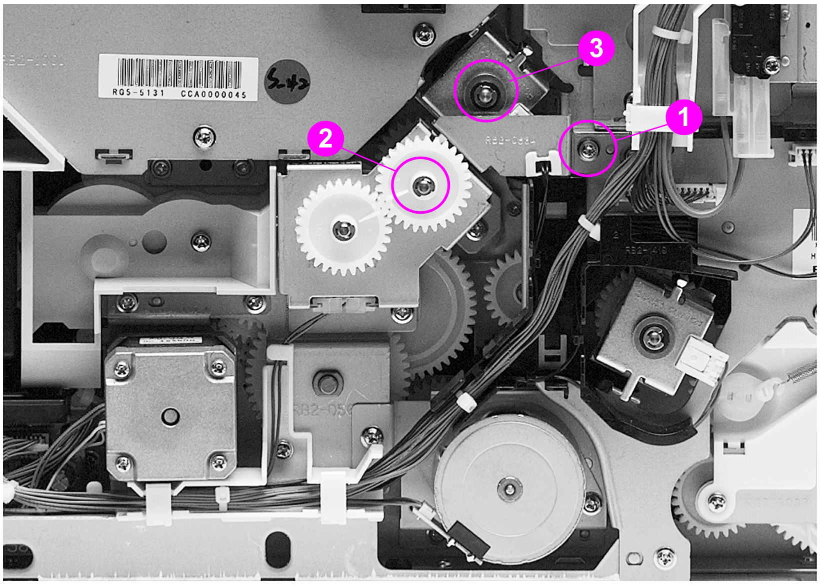


Figure 6-51 ITB cleaning roller clutch removal and replacement

CAUTION Make sure that the clutch assembly gears are correctly reinstalled. For older printers, the gear alignment marks should be offset by one gear tooth as shown in Figure 6-51; for newer printers, the gears, which have a double line, should be aligned.

ITB clutch (CL2) assembly

To remove the ITB clutch assembly

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the ITB cleaning roller clutch.
4. Remove the screw shown in Figure 6-52 and remove the plastic shroud.

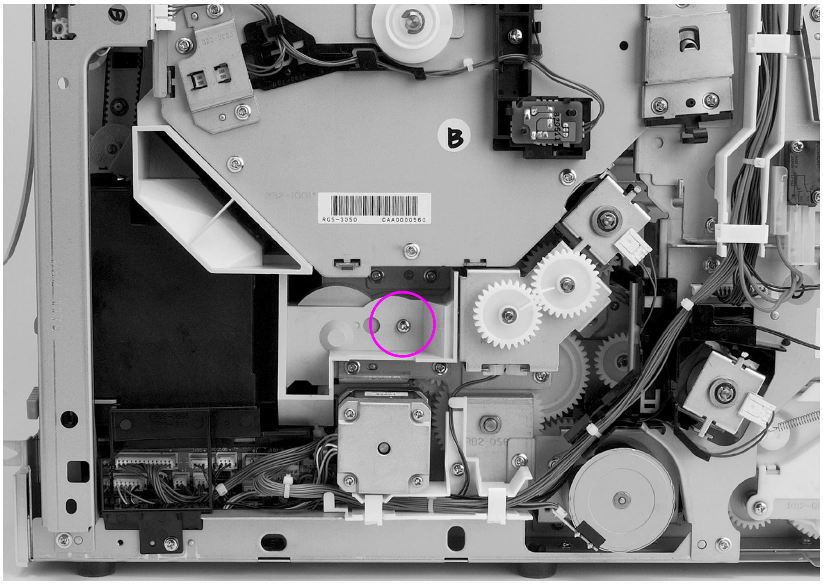


Figure 6-52 ITB clutch assembly removal and replacement (1 of 2)

5. Disconnect the cable from the clutch assembly.
6. Remove the three screws shown in Figure 6-53 and remove the clutch assembly.

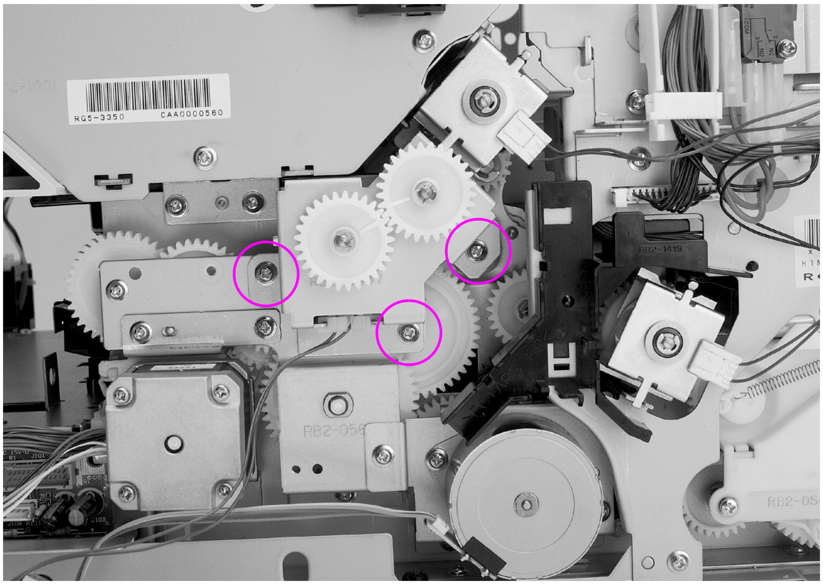


Figure 6-53 ITB clutch assembly removal and replacement (2 of 2)

CAUTION Make sure that the clutch assembly gears are correctly reinstalled. For older printers, the gear alignment marks should be offset by one gear tooth as shown in Figure 6-51; for newer printers, the gears, which have a double line, should be aligned.

For proper operation, ensure that the ITB clutch (CL2) is connected to J103 on the Paper Feed PCB and that the ITB cleaning roller clutch (CL3) is connected to J104.

Transfer roller cam clutch (CL4)

To remove the transfer cam clutch

1. Remove the top cover.
2. Remove the left side cover.
3. Disconnect the connector (J105 at the Paper Feed PCB) from the clutch.
4. Remove the e-clip shown in Figure 6-54 with needle-nose pliers and remove the clutch.

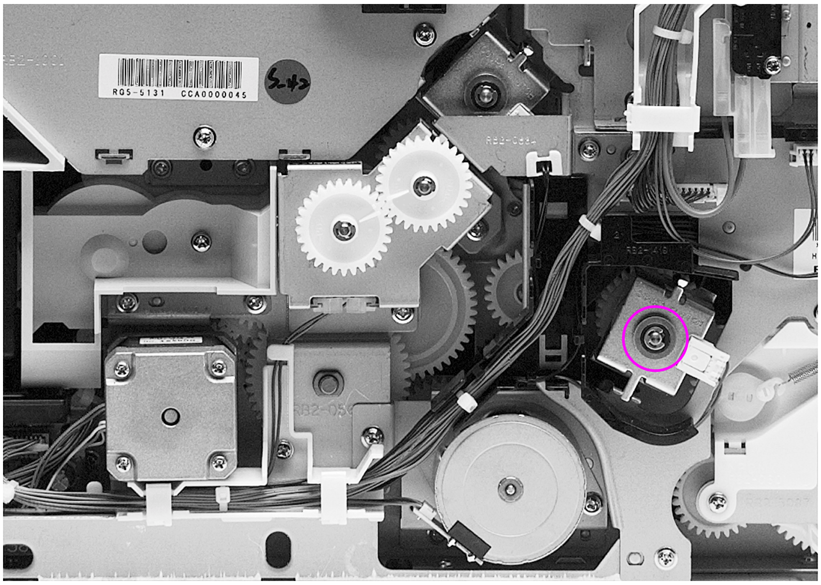


Figure 6-54 **Transfer roller cam clutch removal and replacement**

Replacement tip

For proper operation, ensure that the cable is connected to J105 on the paper feed PCB.

Left side gears

To remove the left side gears

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the fusing assembly.
4. Remove the screw shown in callout 1, Figure 6-47 on page 185 and remove the black plastic piece.
5. Disconnect all connectors from the paper feed PCB and free the cables from the cable stays.
6. Remove the screw securing the gear cover and remove the cover shown in callout 3, Figure 6-47 on page 185.
7. Remove the fuser motor.
8. Remove the paper path motor.
9. Remove the three clutches: CL2, CL3, and CL4.
10. Remove the four screws (callout 1, Figure 6-55 on page 194) and remove the sheet metal over the gears.
11. Remove the one or two screws (shown in callout 2, Figure 6-55 on page 194) and e-clip (shown in callout 3, Figure 6-55 on page 194) that hold the solenoid assembly in place and then remove the solenoid assembly.
12. Remove any e-clips or bushings necessary to remove the affected gears.

Left side gear replacement

1. Install the back half of the large double gear shown in callout 1, Figure 6-56 with the small portion of the gear (18T) facing outward.
2. Install the two gears (shown in callout 2, Figure 6-56 on page 194) so they cover the back half of the large double gear.
3. Install the remaining gears and the front half of the large double gear so they appear as shown in Figure 6-56 on page 194.

CAUTION When reinstalling the solenoid assembly, make sure that the flat parts of the pickup rollers are down and that the plastic spring-loaded gear is fully engaged.

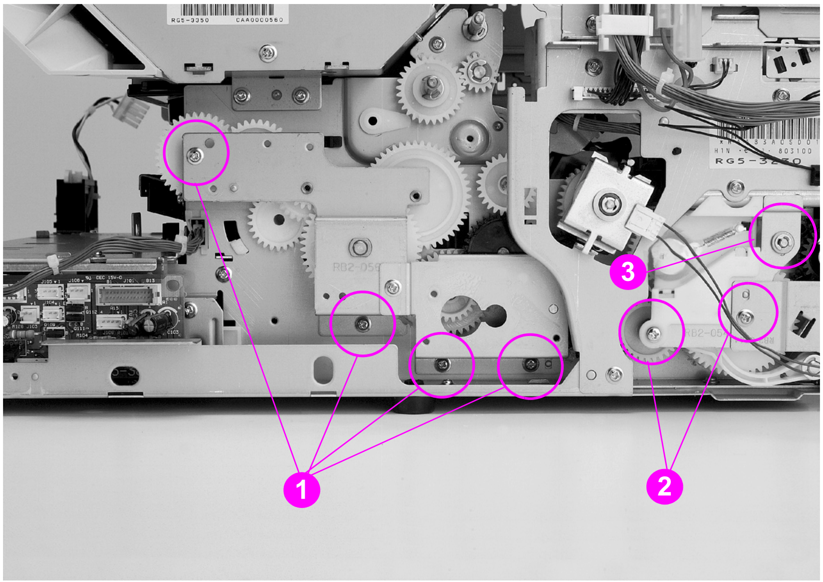


Figure 6-55 Left side gears removal and replacement (1 of 2)

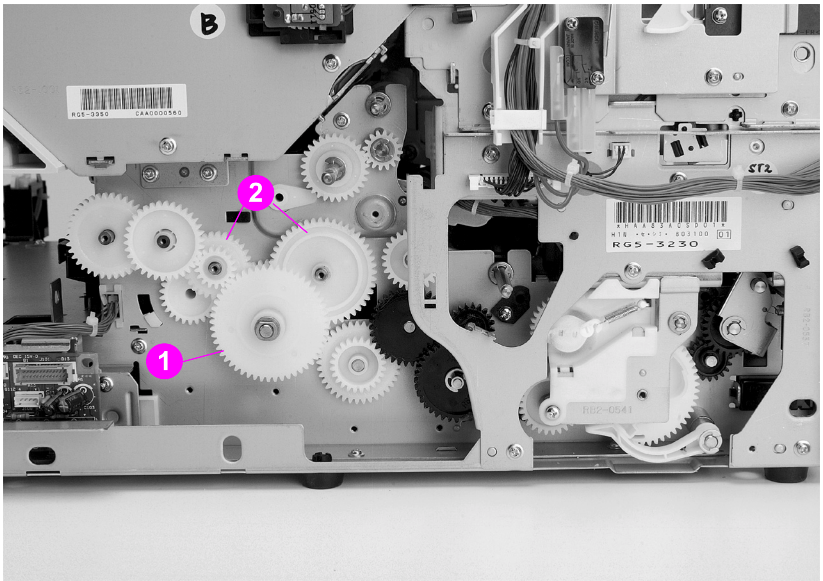


Figure 6-56 Left side gears removal and replacement (2 of 2)

Rear assemblies

Large right side fan

To remove the large right side fan

1. Remove the formatter pan assembly.
2. Remove the four screws as shown in Figures 6-57 and 6-58, and remove the fan shield.
3. Disconnect the fan cable (J209) from the developing PCB.
4. Unweave the fan cable from the cable stays.
5. Release the plastic tabs at the top and bottom of the fan housing, and then slide the fan out.

Large right side fan replacement tip

Ensure that the fan cable is facing out and located in the lower corner.

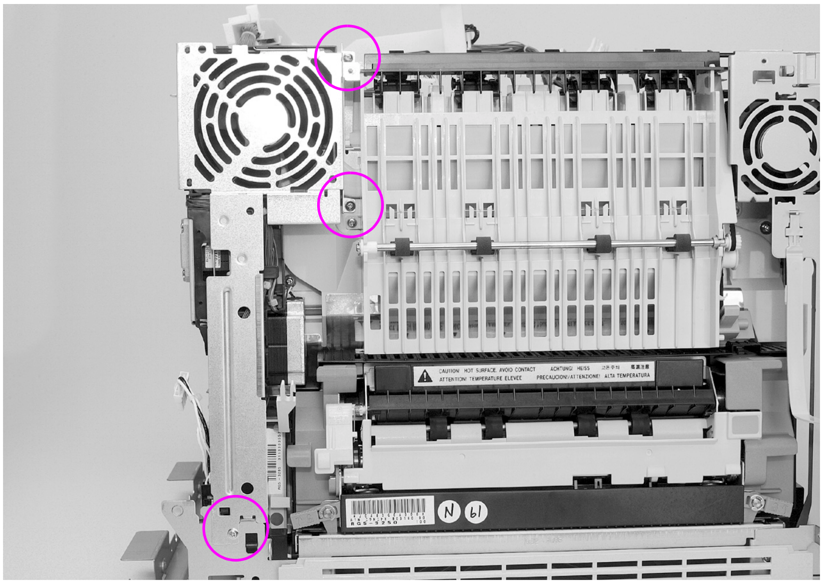


Figure 6-57 **Large right side fan removal and replacement (1 of 2)**

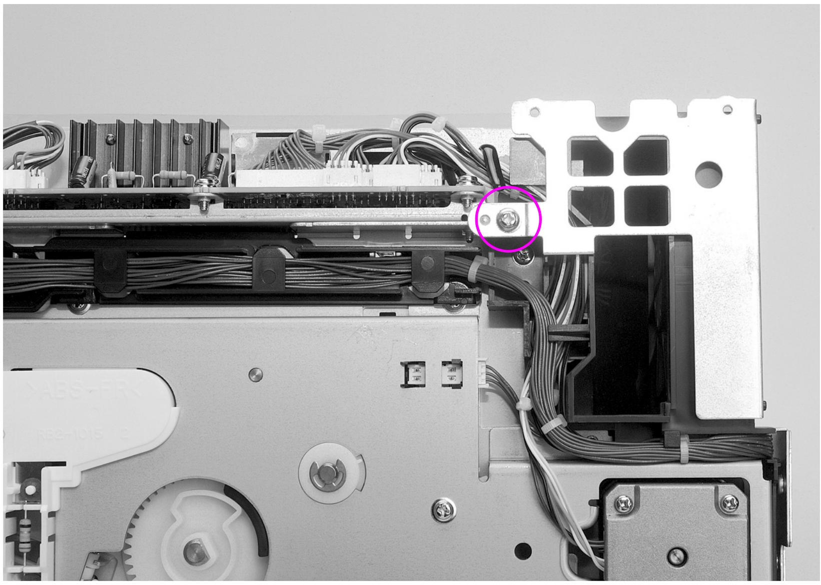


Figure 6-58 Large right side fan removal and replacement (2 of 2)

Left side fan

To remove the left side fan

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the rear door.
4. Disconnect the cable shown in callout 1, Figure 6-59.
5. Remove the three screws from the left rear fan shield shown in Figures 6-59 and 6-60 (callout 2) and remove the fan shield.
6. Disconnect the cable shown in callout 1, Figure 6-61.
7. Remove the screw from the black plastic cover and remove the fan casing shown in callout 2, Figure 6-61.
8. Free the fan cable from the cable stay.
9. Press out on the three plastic tabs and slide the fan out.

Left side fan replacement tip

Verify the label is facing out when replacing the left-side fan.

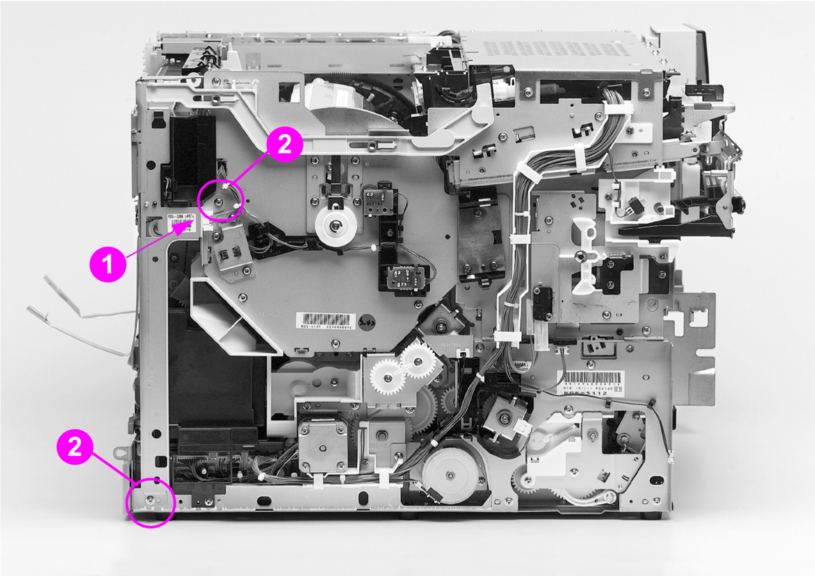


Figure 6-59 **Left side fan removal and replacement (1 of 3)**

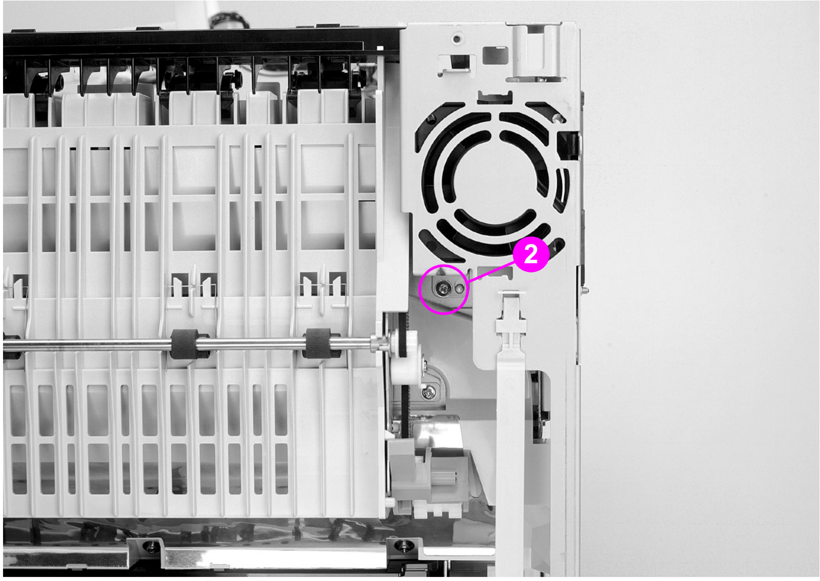


Figure 6-60 Left side fan removal and replacement (2 of 3)

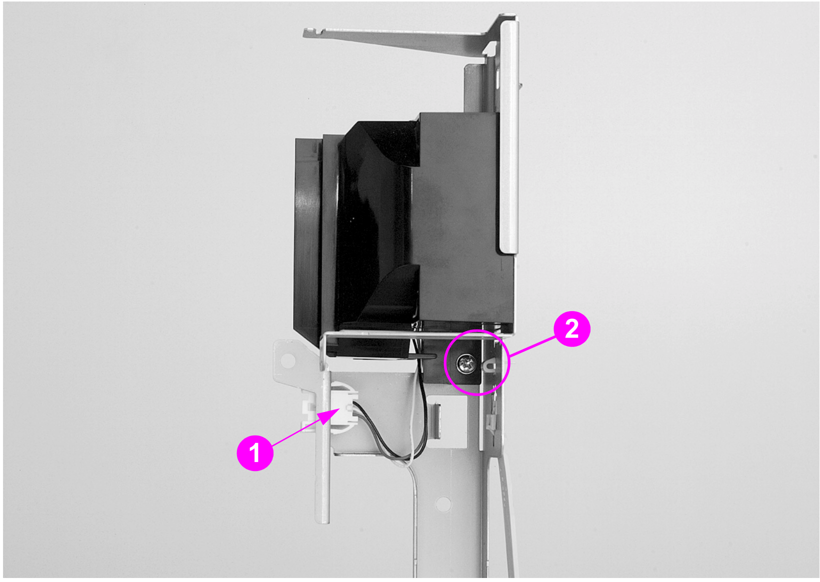


Figure 6-61 Left side fan removal and replacement (3 of 3)

Face-down assembly

To remove the face-down assembly

1. Remove the top cover.
2. Remove the left side cover.
3. Remove the rear door.
4. Remove the left side fan.
5. Disconnect the bin full sensor shown in callout 1, Figure 6-62, and free the cable from the cable stay.
6. Remove the three screws from the face-down assembly shown in callouts 2 and 3, Figure 6-62.
7. With your right hand, lift up slightly on the assembly to release the tab. Then, pull the assembly out with your right hand while pushing the assembly to your right to release the plastic tab on your left.

Replacement tip

Note the position of the black shoulder screw and metal bracket shown in callout 3, Figure 6-62.

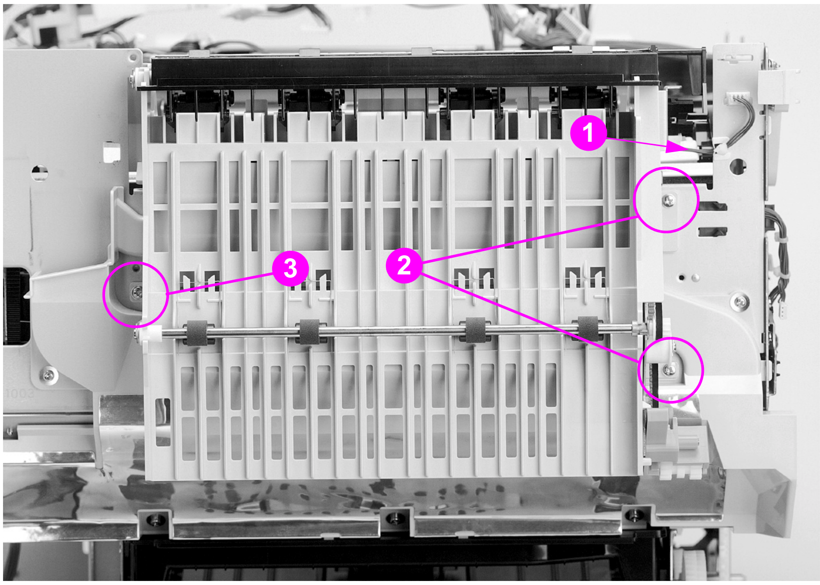


Figure 6-62 **Rear paper path assembly removal and replacement**

Internal assemblies

Cartridge carousel assembly

To remove the cartridge carousel assembly

1. Remove the intermediate transfer belt and imaging drum cartridge. Protect the drum cartridge from light.

CAUTION Exposure to light for more than 15 seconds can seriously damage the imaging drum.

2. Remove the developers (toner cartridges) from the carousel and store them in a safe place.
3. Remove the top cover (see “Top cover” on page 144).
4. Remove the left side cover (see “Left side cover” on page 145).
5. Remove the right side cover (see “Right side cover” on page 146).
6. Remove the rear door (see “Rear door” on page 147).
7. Remove the control panel and front right cover (see “Control panel” on page 153 and “Front right cover” on page 155).
8. Remove the rear cover (see “Right rear cover” on page 148).
9. Remove the RFI shield (see “Radio Frequency Interference (RFI) shield” on page 156.
10. Remove the formatter assembly (see figure 6-63).

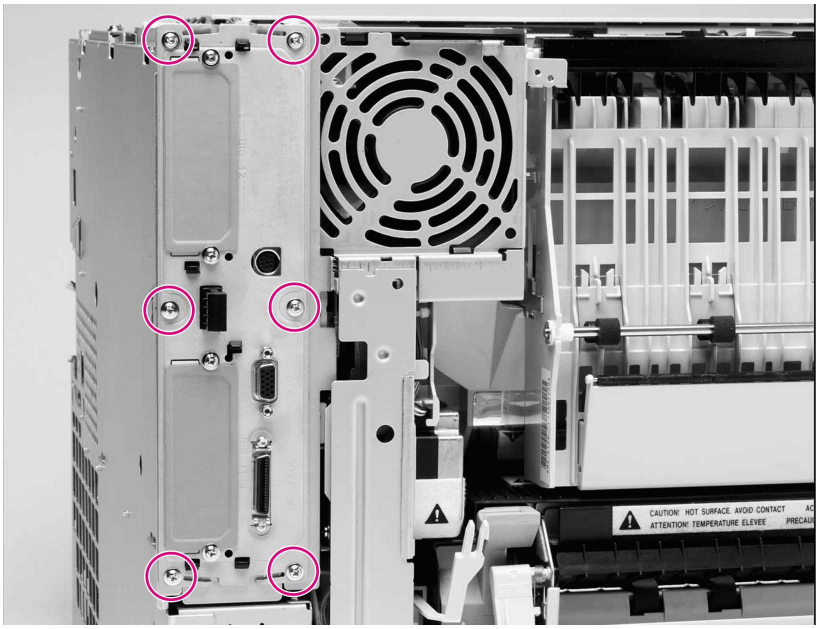

CAUTION: HOT SURFACE. AVOID CONTACT
ATTENTION: TEMPERATURE ELEVEE

Figure 6-63 **Cartridge carousel replacement - formatter pan assembly (1 of 6)**

11. Remove the low-voltage power supply (see “Power supply” on page 173).
12. Remove the high-voltage power supply (see “High-voltage power supply” on page 174).
13. Remove the continuous toner level sensor assembly (see figure 6-64).
14. Remove the developer PCB assembly (see “To remove the developing PCB” on page 159), and then remove the developer PCB mounting plate by removing the four screws of the plate underneath the developer PCB assembly and lifting the plate out.
15. Remove the large fan housing and the large fan (see “Large fan housing” on page 178).

16 Remove the carousel drive assembly (see “Carousel drive assembly” on page 179).

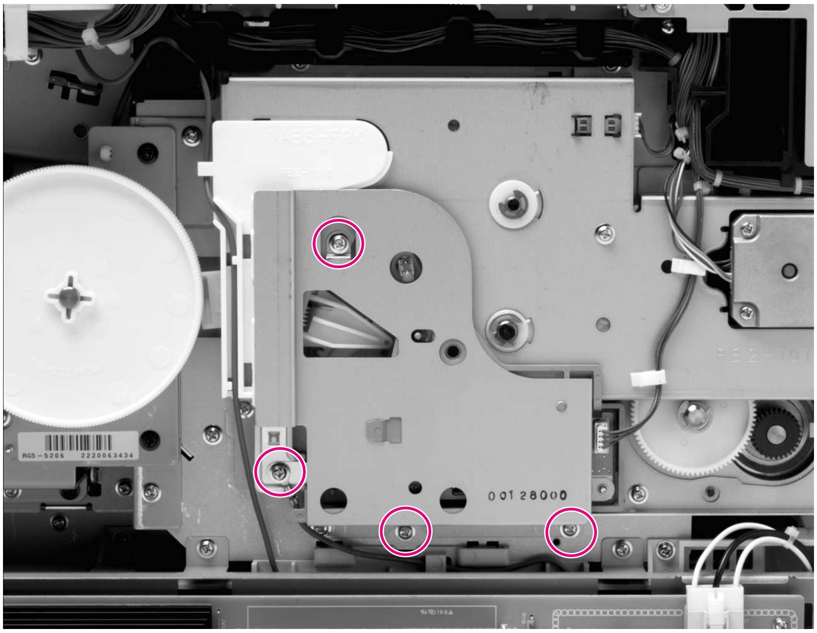


Figure 6-64 **Cartridge carousel replacement - continuous toner level sensor assembly (2 of 6)**

17 Remove the laser shutter cover by pushing down on the silver tab in the middle and then rotating the shutter toward the rear of the printer (see Figure 6-19).

18 Remove the carousel brake (see Figure 6-65).

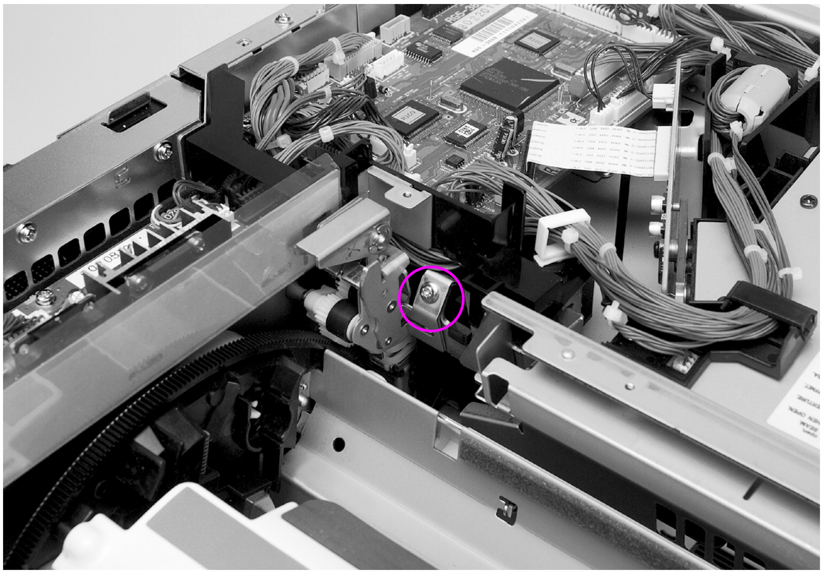


Figure 6-65 **Cartridge carousel replacement - carousel brake (3 of 6)**

19 Remove the small fan housing assembly (see “Left side fan” on page 197).

20 Remove the face-down delivery assembly (see “Face-down assembly” on page 199).

21 Remove the interlock delivery rod (see Figure 6-66, callout 1).

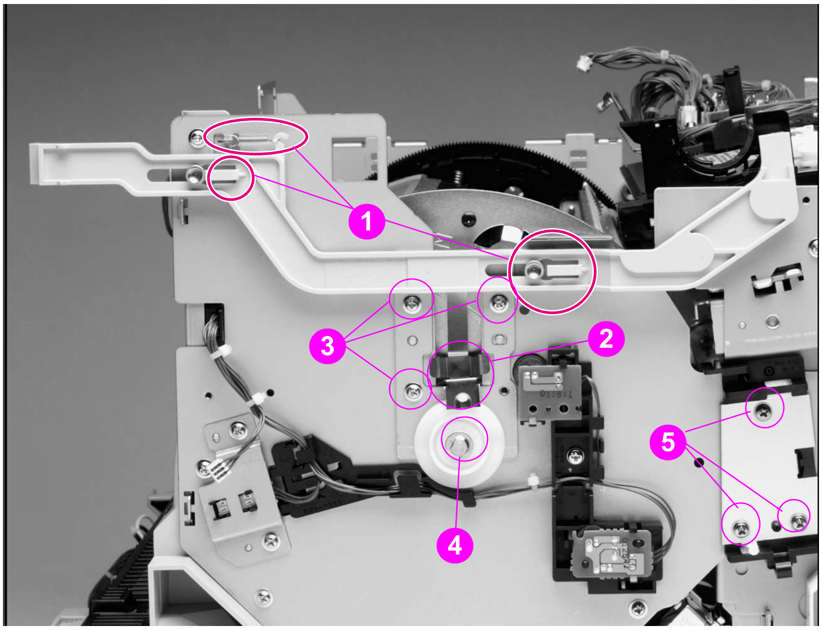


Figure 6-66 Cartridge carousel replacement - face-down delivery rod (4 of 6)

22 Remove the door switch assembly (see “Top cover switch assembly” on page 161).

23 Remove the carousel grounding plate (see Figure 6-66, callout 2) and the carousel position plate from the carousel mouting plate (see Figure 6-66, callout 3) on the printer’s right side.

24 Disconnect the cables going to PS-11 and the Continuous Toner Level Sensor (CTLS) assembly, and remove the CTLS (see Figure 6-39).

25 Using a flat-bladed screwdriver, remove the clip securing the grounding cam and lift off the grounding cam (see Figure 6-66, callout 4).

26 Remove the drum bushing assembly (see Figure 6-66, callout 5).

27 Remove the left-side carousel mounting plate.

28 Remove all visible screws from the carousel mounting plate on the printer’s right side (see Figure 6-67).

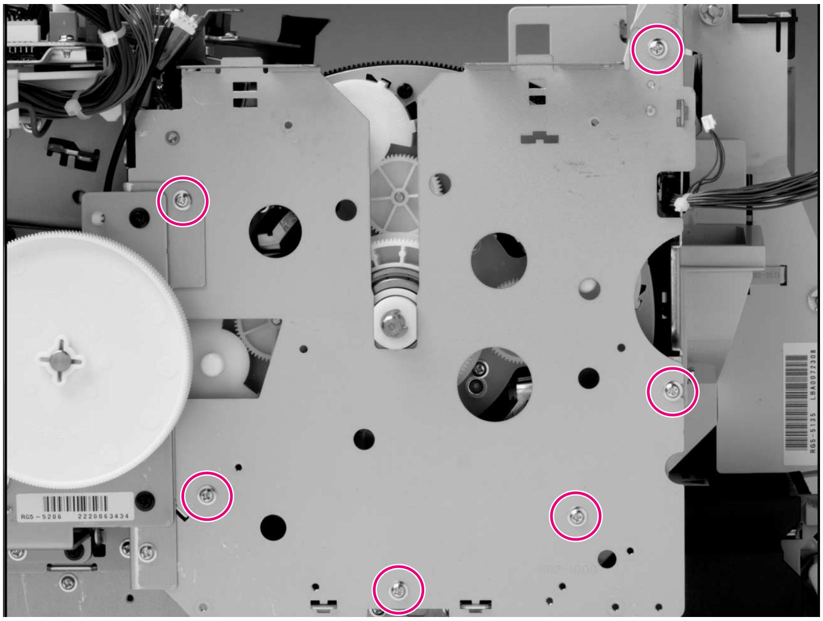


Figure 6-67 Cartridge carousel replacement - right-side carousel mounting plate (5 of 6)

29 Standing at the rear of the printer, lift the left side of the carousel while applying pressure toward you to the rear cross-member plate. As soon as the carousel clears the right-side carousel mounting plate, lift and rotate the carousel to your left to clear the assembly (see Figure 6-68).

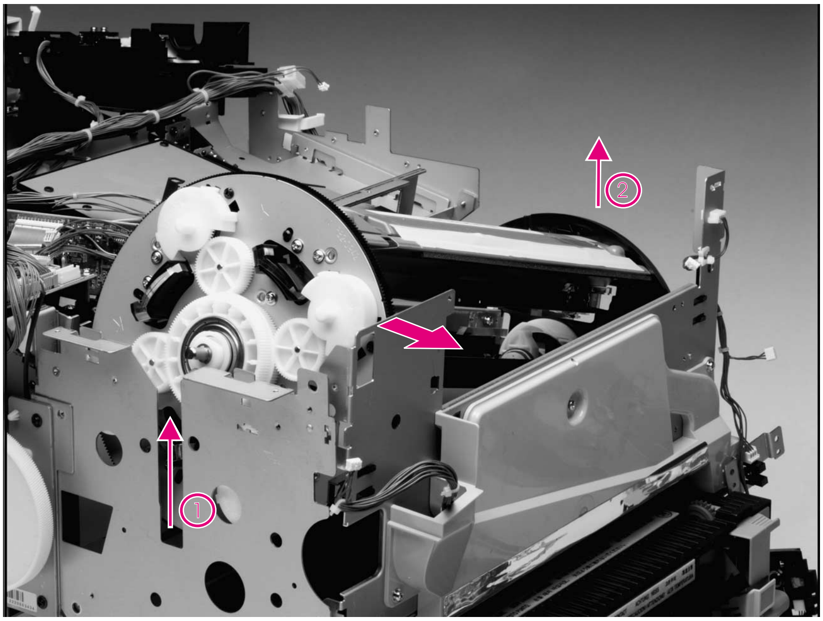


Figure 6-68 **Cartridge carousel replacement - lift out the cartridge carousel (6 of 6)**

30 When the carousel is out of the engine, remove the 125-tooth gear, bearing and plastic spacer. Install them into the replacement carousel.

31 Install the end of the carousel, opposite the 125-tooth gear into the holder. Rotate and move the carousel down and to the right of the shroud. Apply pressure toward you on the sheet metal to allow the carousel to drop into place.

32 Position the ends of the carousel so that the left side carousel mounting plate fits the plastic hub. Make sure the plastic spacer is still on the shaft with the 125-tooth gear.

33 Assemble in reverse order of disassembly.

Toner catch tray and paper transport assembly

To remove the paper transport assembly

1. Remove the fusing assembly.
2. Remove the toner catch tray by pushing down on the clip in the middle and sliding it straight out as shown in callout 1, Figure 6-69.
3. Remove the screw from the rear of the assembly (callout 2).
4. Slide the paper transport assembly toward your left until it stops. Tilt the assembly up to clear the drive shaft coupler on your right and carefully work the assembly out of the printer.

Paper transport assembly replacement tip

Verify that all tabs are under the metal slots (two on the right, one on the left) and that the drive shaft coupler engages properly.

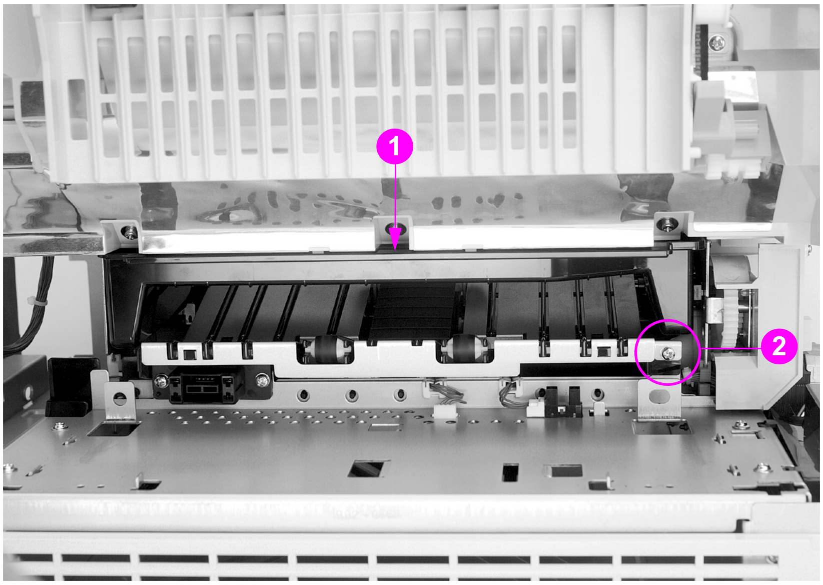


Figure 6-69 **Paper transport assembly removal and replacement**

Paper pick rollers

To remove the paper pick rollers

Remove Tray 2. Determine which version of the printer you are working with, and follow the instructions provided below, for the appropriate version of the printer.

For 4500 series printer serial numbers xx*G* or lower

The paper pick roller shaft is held in place with two white plastic clips.

Pull the paper pick roller shaft down until it releases from the two plastic clips shown in callout 1, Figure 6-70.

For 4500 series printer serial numbers xx*H* or higher and 4550 series printrs

Note The paper pick roller shaft is held in place with two black plastic clips.

Do **not** remove the roller shaft unless you have to replace it. To replace the individual pick rollers, rotate the shaft by hand so that the flat parts of the D-shaped rollers are facing up. Grasping the center of the D-shaped roller with one hand, press down on the roller clip on the flat portion of the roller with the other hand and pull it off of the shaft. If you need to remove the entire shaft, insert a small flat-blade screwdriver into both of the plastic clips (as shown in callout 2, Figure 6-70) to remove the roller.

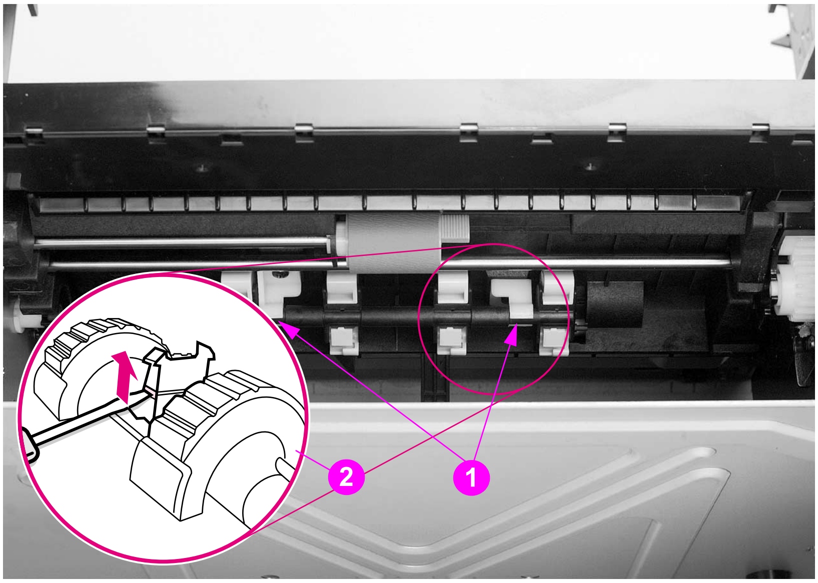


Figure 6-70 **Paper pick rollers removal and replacement**

Paper pick roller replacement tip

When reinstalling the roller shaft, make sure that the flat parts of the D-shaped rollers are facing down.

Star wheel assembly

To remove the star wheel assembly:

1. Remove the ITB drawer.
2. Open the drum drawer and remove the drum cartridge.
3. Disconnect the spring as shown in (callout 1).
4. Remove the linkage screw on the left (callout 2).
5. Carefully pull the assembly forward to remove it from the shaft.

Star wheel assembly replacement tip

Insert the linkage over the shaft first.

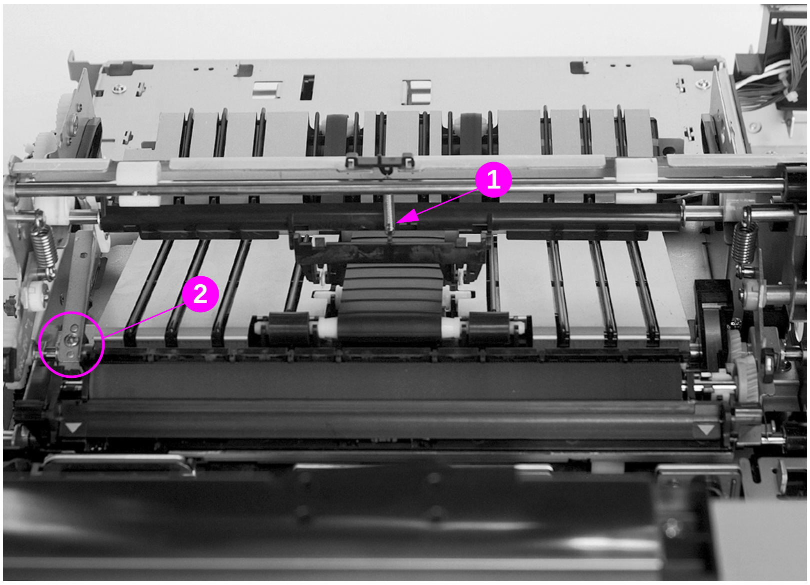


Figure 6-71 **Star wheel assembly removal and replacement**

Transfer roller assembly

To remove the transfer roller assembly

1. Remove the HVPS.
2. Remove the left side cover.
3. Remove the ITB drawer.
4. Open the drum drawer and remove the drum cartridge.
5. Remove the star wheel assembly.
6. Using needle-nose pliers, remove the E-ring on each side of the shaft.
7. Remove the gear.
8. Remove the bushings.
9. Slide the assembly out of the chassis.

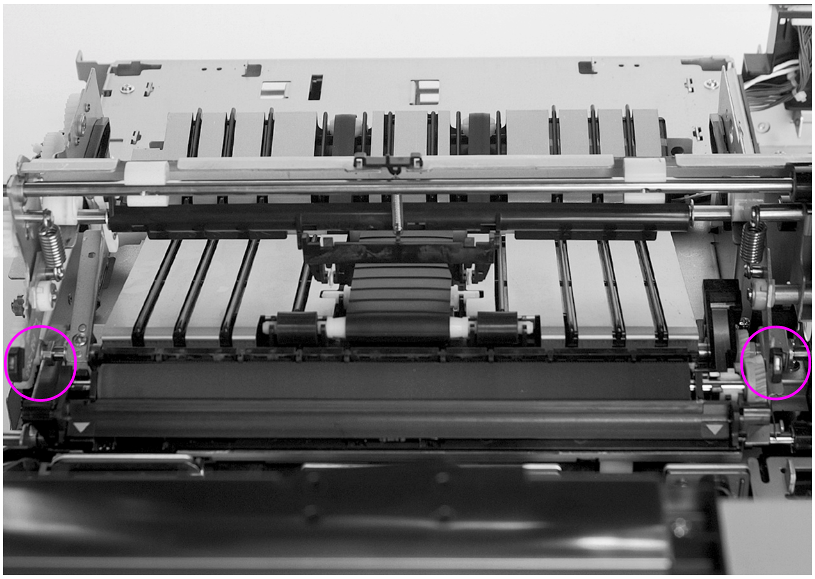


Figure 6-72 **Transfer roller removal and replacement**

Cam shafts

To remove the cam shafts

1. Remove the HVPS.
2. Remove the left side cover.
3. Remove the ITB drawer.
4. Open the drum drawer and remove the drum cartridge.
5. Remove the appropriate clutch or gear on the left side.
6. Using needle-nose pliers, remove the e-rings from each end of the shaft being removed.
7. Remove the bushings.
8. Remove the shaft.

Note If the shaft is undamaged, then only the cams need to be replaced. Remove the screw from the cam and replace only the cam.

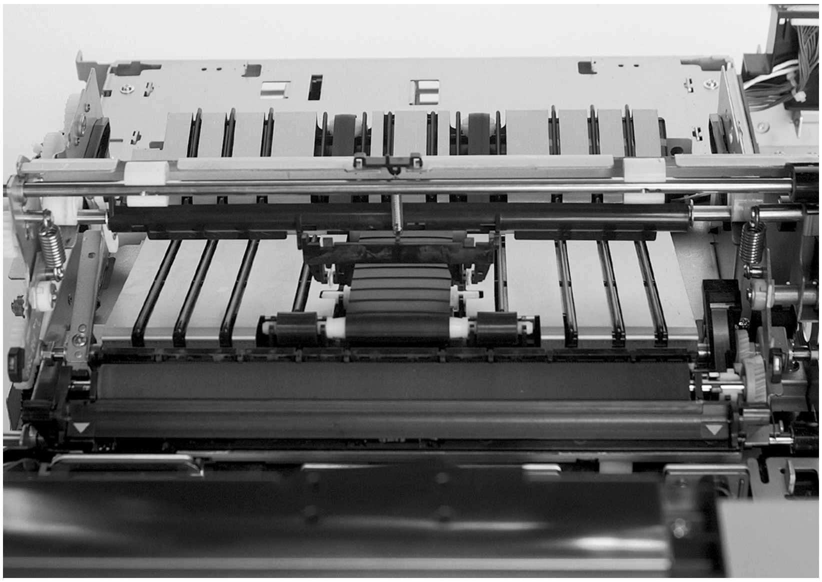


Figure 6-73 **Cam shaft removal and replacement**

7 Troubleshooting

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Introduction

This troubleshooting chapter assumes the reader has a basic understanding of the color laser printing process. Explanations of each mechanical assembly, printer systems, and the basic theory operation are found in Chapter 5. Do not perform any of these troubleshooting processes without fully understanding the function of each mechanism.

This chapter contains the following sections:

- **Troubleshooting process** includes a pre-troubleshooting checklist and a troubleshooting flowchart. These tools contain information about common printer errors that can inhibit proper operation or create print quality problems. These tools also include recommendations for solving the cause of the error.
- **Printer error troubleshooting** explains each control panel display message and suggests recommendations for clearing the cause of each message. When the printer message indicates a failure whose root cause is not obvious, use the printer error troubleshooting section and the troubleshooting tools section found later in this chapter to solve the problem.
- **Paper path troubleshooting** provides techniques to solve feed problems. Explanations regarding print media checks, troubleshooting jams, and the differences between jams caused by media and those caused by the printer are discussed.
- **Image formation troubleshooting** provides print samples to help identify print defects, and suggests methods for solving the problems.
- **Interface troubleshooting** provides techniques for isolating communication problems to the printer hardware, printer configuration, network configuration, or software application.
- **Control panel troubleshooting** provides procedures for printing a menu map from the printer control panel, and describes the control panel menus, the items within each menu, and the possible values for the menu items.
- **Troubleshooting tools** help isolate the cause of printer failures. This section includes explanations of the printer configuration page, and the event log.
- **The service mode** section provides procedures for entering service mode and performing service-oriented tasks. These tasks include counts for entering the serial number, transfer maintenance, fuser maintenance, color page, total page, clearing the event log, and various printer tests.
- **The diagnostics mode** section provides instructions on how to access and use the diagnostic tools incorporated into the printer.
- **Diagrams** provides graphical locations and tables for the printer’s internal assemblies and sensors.

Troubleshooting process

The troubleshooting process requires both a mental and hands-on investigation of printer errors and problems.

- Use the pre-troubleshooting checklist to evaluate the source of the problem and to reduce the number of steps required to fix the problem.
- Use the troubleshooting flowchart to pinpoint the root cause of hardware malfunctions. The flowchart guides you to the appropriate section of this chapter that provides steps for correcting the malfunction.

Check the printer for the following before troubleshooting a specific printer problem:

- Has regular maintenance been performed?
- Are the maintenance units within their rated life?
- Does the configuration page reveal any configuration errors?

Note The customer is responsible for checking consumable items, and using consumables that are in good working condition.

Pre-troubleshooting checklist

The list below describes basic questions to ask the customer to help you quickly define the problem(s).

Table 7-1 Pre-troubleshooting checklist

Environment	● Is the printer installed on a solid, level surface? ● Is the power supply voltage within ± 10 volts of the specified power source? ● Is the power supply plug inserted in the printer and the outlet? (Also verify that the short power cord of the duplex unit is plugged into the printer, and the power supply plug of the paper deck at the duplex unit is properly connected.) ● Is the operating environment within the specified parameters, as listed in Chapter 1 of this manual? ● Is the printer exposed to ammonia gas, such as that produced by diazo copiers or office cleaning materials? ● Is the printer exposed to direct sunlight?
Media checks	● Does the customer use only supported media? ● Is the media in good condition (no curls, folds, etc.)? ● Is the media stored correctly and within environmental limits?
Media source	● Is the specified volume (or less) loaded into the media source? ● Is the printer set to the correct media source?
Toner cartridge	● Are the color toner cartridges for each color correctly installed?
Drum cartridge	● Is the drum cartridge seated in the printer properly?
ITB and fusing	● Are the ITB and fusing units seated properly?
Doors and drawers	● Are the toner cartridge door, duplexer, drum drawer, and ITB drawer closed?
Condensation	● Does condensation occur following a temperature change (particularly in winter following cold storage)? If so, wipe affected parts dry or leave the printer on for 10 to 20 minutes.
Miscellaneous	● Check for and remove any non-HP components (toner, memory modules, and EIO cards) from the printer. ● If hardware or software configuration has not changed, or the problem is not associated with any specific software, contact the Customer Care Center (see Chapter 1). ● Remove the printer from the network and ensure that the failure is associated with the printer before beginning troubleshooting. ● Remove the printer from the network and ensure that the failure is associated with the printer before beginning troubleshooting.

WARNING! Electrical current is present in various printer parts whenever the printer is plugged in, even if the power switch is in the standby position. Line voltage is exposed when the right cover and formatter pan are removed.

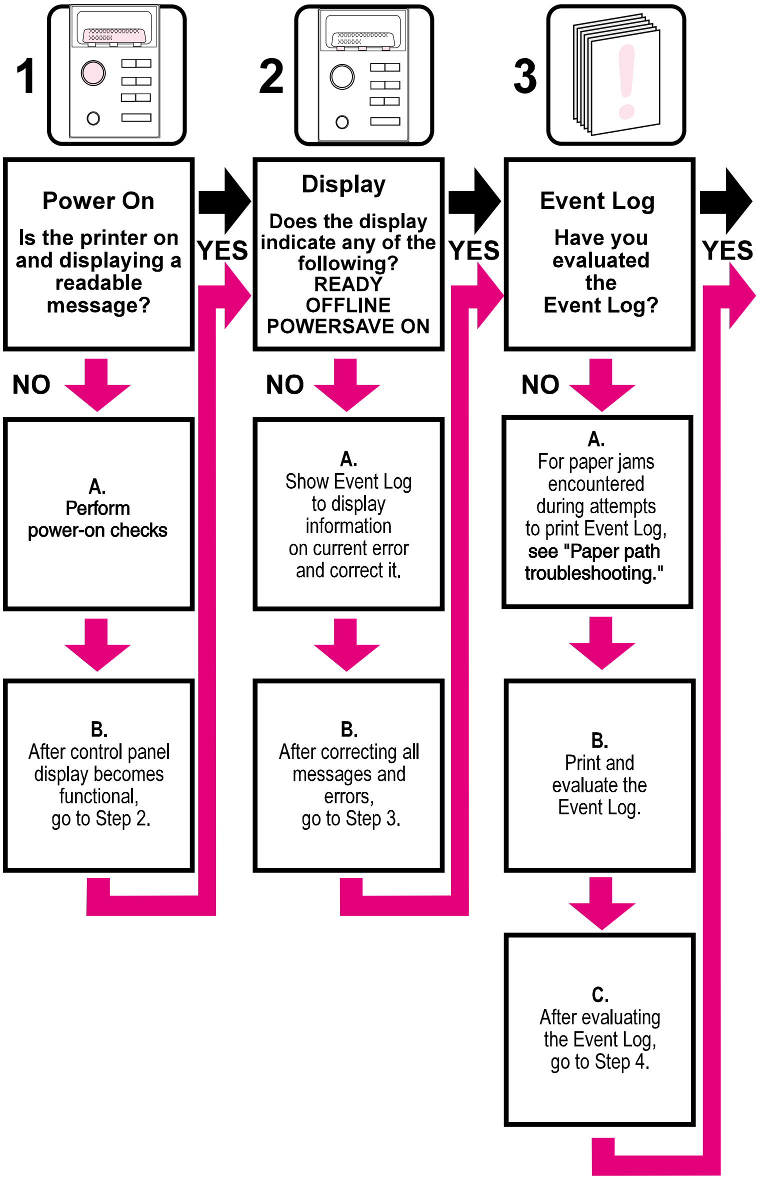
Troubleshooting flowchart

The troubleshooting flowchart shown in Figure 7-1 highlights the processes that quickly solve printer hardware problems. During its power on sequence, the printer verifies that its components are operating correctly. If the printer fails to power on correctly, use the steps shown to troubleshoot the failure.

Each heading depicts a major troubleshooting step. A “yes” answer to the questions allows you to proceed to the next major step.

A “no” answer indicates that additional testing is needed. Proceed to the referenced location and follow the directions for that area. After completing the additional testing, proceed to the next major step.

Figure 7-1 **Troubleshooting flowchart (1 of 2)**


1
Power On
Is the printer on and displaying a readable message?
YES
NO
A. Perform power-on checks
B. After control panel display becomes functional, go to Step 2.
2
Display
Does the display indicate any of the following? READY OFFLINE POWERSAVE ON
YES
NO
A. Show Event Log to display information on current error and correct it.
B. After correcting all messages and errors, go to Step 3.
3
Event Log
Have you evaluated the Event Log?
YES
NO
A. For paper jams encountered during attempts to print Event Log, see "Paper path troubleshooting."
B. Print and evaluate the Event Log.
C. After evaluating the Event Log, go to Step 4.

Troubleshooting flowchart (continued)

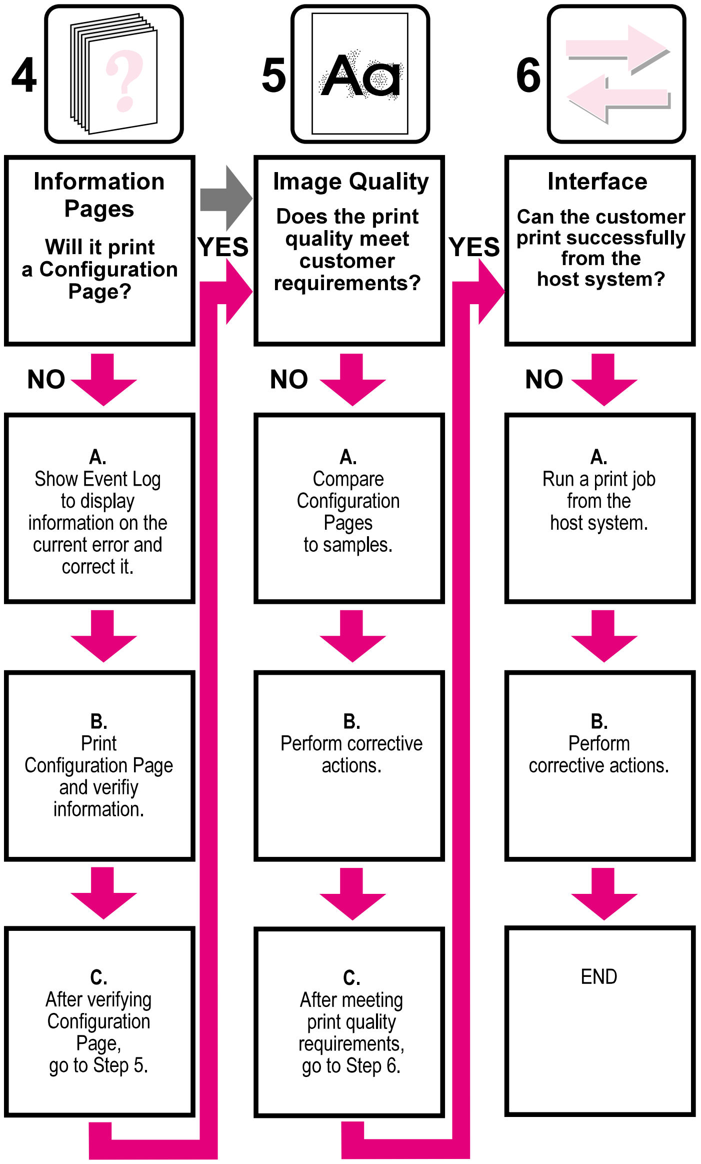

4
Information Pages
Will it print a Configuration Page?
YES
NO
A. Show Event Log to display information on the current error and correct it.
B. Print Configuration Page and verifiy information.
C. After verifying Configuration Page, go to Step 5.
5
Aa
Image Quality
Does the print quality meet customer requirements?
YES
NO
A. Compare Configuration Pages to samples.
B. Perform corrective actions.
C. After meeting print quality requirements, go to Step 6.
6
Interface
Can the customer print successfully from the host system?
NO
A. Run a print job from the host system.
B. Perform corrective actions.
END

Figure 7-2 Troubleshooting flowchart (2 of 2)

Troubleshooting power-on

Power-on check

1. Verify that the printer is plugged into an active electrical outlet of the correct voltage.
2. Verify that the power-on button is pushed in.
3. Verify that the duplex unit short cord is plugged in to the printer.
4. Make sure the fans are still running.

Note If the front panel display looks dark and an error message appears, check the ribbon cable between the formatter and the DC controller.

5. Remove any HP JetDirect or other EIO cards, then retry powering-on the printer.
6. Make sure the control panel display is on.
7. Check fuse in power supply (see Figure 7-36).
8. Replace the power supply.
9. Replace the interconnect PCB.

Printer error troubleshooting

Printer messages

The following tables explain messages that might appear on the printer control panel. Alphabetical printer messages and their meanings are listed in Table 7-2, and numerical printer messages are listed in Table 7-3.

Hint If a message requesting that you load a tray persists, or if a message indicating that a previous print job is still in the printer's memory persists, press [GO] to print or press [CANCEL JOB] to clear the job from the printer's memory.

Note Not all messages are described in the tables; those messages that are not listed are self-explanatory.

Some printer messages are affected by the `AUTO CONTINUE` and `CLEARABLE WARNING` settings from the Configuration Menu on the printer control panel:

- If `CLEARABLE WARNING=JOB` is set on the control panel, warning messages appear until the end of the job from which they were generated.
- If `CLEARABLE WARNING=ON` is set, warning messages appear until [GO] is pressed.
- If an error occurs that prevents printing and `AUTO CONTINUE=ON` is set, the printer goes offline for 10 seconds before it returns online.
- If `AUTO CONTINUE=OFF` is set, the message appears until [GO] is pressed.

Alphabetical printer error messages

Table 7-2 Alphabetical printer error messages

ACCESS DENIED MENUS LOCKED	**Description:** Appears for approximately 5 seconds when a user has attempted to select a menu value while the printer control panel locking is enabled.	**Action:** See the system administrator for access to the printer control panel.
BAD DUPLEXER CONNECTION	**Description:** The duplex unit is not correctly installed.	**Action:** 1. Verify that the power cord is connected to the duplex printing accessory and the short power cord from the duplex printing accessory is connected to the printer. 2. Turn printer off and then on. 3. If the error continues, verify that the duplex unit is correctly installed. 4. If error persists, replace duplex unit.
CALIBRATION EXECUTING	**Description:** The printer is executing an internal color calibration. This process should take approximately 90 seconds.	**Action:** No action required.
CANCELING JOB	**Description:** The printer is canceling the current print job. Incoming data for the current job will be discarded.	**Action:** No action required.

Table 7-2 Alphabetical printer error messages (continued)

CANNOT DUPLEX **CLOSE REAR BIN**	Description: The printer cannot duplex because the rear output bin is open.	**Action:** 1. Close the rear output bin door. 2. If the error message does not clear, turn the printer off and then on.
CANNOT DUPLEX **CHECK REAR BIN** alternates with **CANNOT DUPLEX** **CHECK PAPER**	**Description:** The printer cannot duplex because the rear output bin is open or the media is not supported by the duplex unit.	**Action:** 1. Close the rear output bin. 2. If the error message does not clear, turn the printer off and then on. Verify that the media is supported by the duplex unit. See “Supported media weights and sizes” in Chapter 1.
CHECKING PRINTER	**Description:** The printer is performing an internal test. This process should take approximately 30 seconds. The message appears during the initiation of the engine test. When finished, the printer goes online.	**Action:** When the test has finished press [Go] to return the printer to the READY state.
CLEARING PAPER **FROM PRINTER**	**Description:** The printer has jammed or was turned on and media was detected in the paper path. The printer is attempting to clear these pages.	**Action:** No action required.
CLOSE FRONT DUPLEX DRAWER	**Description:** The duplex drawer is not completely closed.	**Action:** Close the duplex drawer.
CLOSE MIDDLE FRONT DRAWER	**Description:** The drawer that holds the intermediate transfer belt is open. This drawer is called the ITB drawer, but is referred to as the middle front drawer for end users. Switch SW1 (refer to Figure 7-31) indicates the drawer is open. When the drawer is closed, a plastic protrusion on the lower left corner of the drawer pivots an arm allowing SW1 to toggle to the open position.	**Action:** 1. Close the ITB drawer. 2. If the message persists, remove the printer’s left-side cover and inspect the mechanical linkage that closes SW1. 3. Refer to the wiring diagram to verify the wiring; the two-wire connector should be firmly seated to SW1 and the wiring harness should be firmly seated to connector J1003 of the DC controller PCB. 4. If the message persists, use an ohmmeter to verify functionality of SW1.
CLOSE UPPER REAR DRAWER	**Description:** Switch SW5 (refer to Figure 7-29) monitors the closing of the printer’s upper rear door (this door allows you to access the fusing assembly). When the fusing door is closed, a tab on the rear door pushes a door switch actuator that runs along the left-side of the printer and closes SW5.	**Action:** 1. Close the upper rear drawer. 2. If the message persists, remove the printer’s left-side cover and inspect the mechanical linkage of SW5 and the lever.

(continued on next page)

Table 7-2 Alphabetical printer error messages (continued)

	3. Refer to the wiring diagram and verify all connections (J103 of the DC controller PCB and to SW5). Verify they are firmly seated. Verify that both the drum and ITB drawers are firmly closed; closing these drawers also closes SW4 (see Figure 7-31).
Note	Closing the rear door, the drum drawer, and the ITB drawers closes SW4 and SW5. When either of these switches is open, the +24 V supply is disabled. This safety feature protects the operator from any high voltages.
CLOSE TOP COVER	
Description: SW2 (refer to Figure 7-29) indicates whether or not the printer's toner access cover is closed. When the toner access cover is closed, a lever is pushed down. This in turn rotates a pivot forward, opening the top cover switch (SW2).	**Action:** 1. Close the top cover. 2. If the message persists, remove the printer's top assembly cover and verify all mechanical linkages associated with SW2 (see Figure 7-29). 3. Verify that the connector on J1003 of the DC controller PCB is firmly seated.
CLOSE UPPER FRONT DRAWER	
Description: The drawer that holds the imaging drum (the drum drawer) is open. Switch SW3 (refer to Figure 7-31) indicates that the drawer is open. When the drawer is closed, a plastic protrusion on the lower left corner of the drawer pivots an arm that allows SW3 to toggle to the open position.	**Action:** 1. Open the drawer and firmly push the drawer closed using one hand in the middle of the drawer. 2. If the message persists, remove the printer's left-side cover and inspect the mechanical linkage that closes SW3. 3. Refer to the wiring diagram and verify the wiring. The two-wire connector should be firmly seated to SW3 and the wiring harness should be firmly seated to connector J1003 of the DC controller PCB. 4. If the message persists, use an ohmmeter to verify functionality of SW3. 5. Verify FM3 (in the front of the Imaging drum drawer) is functioning properly. The fan con-nects via J77 to J1022 on the DC Controller.
Note	Closing the drawer also closes SW4 (the drum drawer switch). When SW4 is open, the +24 V supply is disabled. This safety feature protects the operator from high voltages when the drum or ITB drawer is open.
COLD RESET (4500) -or- **RESTORE FACTORY SETTINGS (4550)**	
Description: The cold reset power-up sequence has been entered.	**Action:** Most printer variables will reset to their factory default values.
CONTINUOUS PAGE **PRESS CANCEL JOB (4500)**	
Description: The printer configuration page is being printed continuously.	**Action:** Press [Cancel Job] to terminate continuous configuration page printing and return the printer to the READY state.
Note	The 4550 has a paper path test that can be run from the Infomraiton menu.
DATA RECEIVED	
Description: The printer has received and processed data and is waiting for a form feed.	**Action:** Press [Cancel Job] and resend the last page of the job making sure a form feed is sent with it, or press [Go] to feed a new sheet of media through the printer.

Table 7-2 Alphabetical printer error messages (continued)

DENSITY SENSOR OUT OF RANGE alternates with **CLEAN DENSITY SENSOR**	**Description:** A density sensor out of range error was detected during a color calibration.	**Action:** The density sensor might be dirty. Inspect and clean the sensor. See Cleaning the toner density sensor (page 85).
DIAGNOSTICS MODE	**Description:** The extended diagnostics power-up key sequence has been entered. Refer to the diagnostics procedures at the end of this chapter.	**Action:** No action required.
DRUM ERROR REPLACE DRUM KIT	**Description:** An error has been detected with a component of the printer drum kit.	**Action:** Replace the drum kit.
DRUM LIFE LOW REPLACE DRUM KIT (4500) -or- **DRUM LIFE LOW ORDER DRUM KIT (4550)**	**Description:** Approximately 80% of the drum's life has been consumed.	**Action:** Continue printing and order the drum kit. Drum replacement will be required when the Drum Life Out message is displayed.
DRUM LIFE OUT REPLACE DRUM KIT	**Description:** The imaging drum has reached the end of its expected life.	**Action:** Replace the drum kit.
DUPLEXER ERROR CHECK DUPLEXER	**Description:** An error has occurred in the duplex unit.	**Action:** 1. Verify that the duplex unit is correctly installed. 2. Verify that the small power cord from the duplex unit is plugged into the printer, and the power cord from the AC outlet is plugged into the duplex unit.
EIO X INITIALIZING YYY alternates with **DO NOT POWER OFF**	**Description:** The EIO device in slot X is initializing. The YYY value will increment every 10 seconds during this process.	**Action:** No action required.
EIO X NOT FUNCTIONAL	**Description:** The EIO slot specified does not have a card installed or is not functional.	**Action:** No action required.
EVENT LOG EMPTY	**Description:** `SHOW EVENT LOG` was selected from the Information Menu, but the Event Log has no entries.	**Action:** No action required.

Table 7-2 Alphabetical printer error messages (continued)

FUSER LIFE LOW REPLACE KIT (4500) -or- **FUSER LIFE LOW ORDER KIT (4550)**	**Description:** Approximately 95% of the fuser's life has been consumed.	**Action:** Continue printing, or replace the fuser kit. Fuser replacement will be required in the near future.
Fuser Life Out Replace Kit	**Description:** The fuser has reached the end of its expected life.	**Action:** Replace the fuser kit.
INITIALIZING	**Description:** The message appears when the printer is initially turned on.	**Action:** No action required.
INSTALL DRUM KIT	**Description:** The drum kit is not installed or is incorrectly installed.	**Action:** Verify that the drum kit is correctly installed.
INSTALL TRAY 2	**Description:** The printer cannot print until media is loaded into Tray 2. The paper path for Tray 3 passes through Tray 2.	**Action:** Insert Tray 2 into the printer so that printing from Tray 3 can continue or start.
MEMORY FULL STORED DATA LOST	**Description:** The printer has no available memory. The current job might not print correctly. Some downloaded fonts might have been deleted.	**Action:** Try printing simplified pages. If this does not resolve the problem, add printer memory.
MEMORY SETTINGS CHANGED	**Description:** The I/O buffering settings were changed by the printer because there is not enough memory available to use the previous settings.	**Action:** No action required. However, adding printer memory might prevent this from occurring.
MEMORY SHORTAGE JOB CLEARED	**Description:** The available memory was not enough to continue printing. The remainder of the job was canceled.	**Action:** No action required. However, adding printer memory might prevent this from occurring.
MEMORY SHORTAGE PAGE SIMPLIFIED	**Description:** The printer's adaptive data compression had to resort to lossy compression to fit raster graphics in the available memory. This has caused a data loss in the raster output.	**Action:** 1. Reduce the complexity of the page to improve the print quality. 2. Adding memory will not correct this problem.
NO JOB TO CANCEL	**Description:** [Cancel Job] was pressed but there is no active job or buffered data to cancel. The printer automatically returns to the READY state.	**Action:** No action required.

Table 7-2 Alphabetical printer error messages (continued)

OFFLINE	
Description: The printer is offline and there are no error messages pending.	**Action:** Press [Go] to return the printer to the READY state.
PAGE CANNOT PRINT NOW alternates with **RETRY WHEN PRINTING STOPS**	
Description: An internal page has been requested while the printer is printing an incoming job. Interrupting the job to print the internal page would corrupt the job's environment and potentially cause the job to finish printing incorrectly after the internal page is completed. Consequently, internal pages are not permitted to interrupt jobs and can only be printed when the printer is idle.	**Action:** Retry the print job after the printer has completed the current job.
PLEASE WAIT	
Description: The printer is in the process of purging data so that it can go offline or into the menus.	**Action:** No action required.
POWERSAVE ON	
Description: The printer is in PowerSave mode. This message is cleared by pressing any key or by the receipt of a print job.	**Action:** No action required.
PRESS GO TO PRINT alternates with **PRESS SELECT TO CHANGE TONER**	
Description: The top cover was opened and closed when the printer was not in toner cartridge replacement mode.	**Action:** Press [Go] to resume printing or press [Select] to enter the toner replacement mode.
PRINTER LANGUAGE NOT AVAILABLE	
Description: The printer received a request for a new language (personality) that does not exist in the printer.	**Action:** No action required.
PRINTING CALIBRATION PAGE	
Description: The color calibration page is being printed. The printer returns to the READY stage upon completion of this page.	**Action:** No action required.
PRINTING CONFIGURATION PAGE	
Description: The configuration page is being printed. The printer returns to the READY stage upon completion of this page.	**Action:** No action required.
PRINTING FONT LIST	
Description: A typeface list for the available personalities is being printed. The printer returns to the READY stage upon completion of these pages.	**Action:** No action required.
PRINTING MENU MAP	
Description: The printer menu map is being printed. The printer returns to the READY state upon completion of this page.	**Action:** No action required.

Table 7-2 Alphabetical printer error messages (continued)

PRINTING REGISTRATION PG	
Description: The registration page is being printed. The printer returns to the READY state upon completion of this page.	**Action:** No action required.
PRINTING LASERJET DEMO (4500) **-or-** **PRINTING DEMONSTRATION (4550)**	
Description: The demo page is being printed. The printer returns to the READY state upon completion of this page.	**Action:** No action required.
PRINTING LASERJET DEMO 2 (4500 only)	
Description: The demo page is being printed. The printer returns to the READY state upon completion of this page.	**Action:** No action required.
PRINTING ACCESSORIES	
Description: The accessories page is being printed. The printer returns to the READY state upon completion of this page.	**Action:** No action required.
PRINTING COLOR GUIDE	
Description: The color guide page is being printed. The printer returns to the READY state upon completion of this page.	**Action:** No action required.
PROCESSING JOB	
Description: The printer is processing the current job.	**Action:** No action required.
READY	
Description: The printer is online and ready to receive data, and no status or device attendance messages are pending.	**Action:** No action required.
REINSTALL TRANSFER BELT	
Description: This message occurs if you do not have the intermediate transfer belt installed in the printer or if the home position marks (on the ITB) are not detected by sensor PS5. **Note** The intermediate transfer belt must be rotating before PS5 is able to detect the “home positioning” marks on the ITB. Both the ITB and the imaging drum are driven by the drum motor (M4).	**Action:** 1. Check SW1 (Figure 7-31) for correct operation and make sure the cables are connected. 2. Verify that the ITB is installed in the printer. 3. If the ITB is installed and seated properly, verify that PS5 is not damaged. PS5 is located on the ITB assembly (see Figure 7-25). If the sensor appears damaged replace the entire ITB assembly. 4. Clean PS5 (see Figure 7-25 for its location). 5. Verify all wiring within the ITB drawer. Note the connection on the ITB assembly (located on the front, lower, left-hand corner of the assembly). When the drawer is closed, the connector “mates” with a receptacle connector on the drawer. Verify the connector and all wiring are in good condition. Make sure there is no paper in the connector at the base of the drawer. 6. Verify that the drum motor (M4) is rotating both the imaging drum and the ITB. Place the printer in diagnostic mode and run the drum test to verify drive spindle movement for both the imaging drum and ITB. 7. If the imaging drum is not rotating, verify the imaging drum connector is firmly seated into the connector J204 of the developing PCB.

Table 7-2 Alphabetical printer error messages (continued)

	Description:	Action:
REMOVE PAPER TOP OUTPUT BIN	The top output bin holds 250 sheets of paper. Sensor PS9 (see Figure 7-21) along with its sensor flag detects the height of the output paper stack. Perform the action items if this message appears with no paper in the output bin.	1. Verify that the PS9 sensor flag and arm move freely and its movement is not blocked (see Figure 7-21). 2. Verify PS9 is free of dust and debris (top assembly cover must be removed to access sensor). 3. Verify all connectors are firmly seated. Refer to the wiring diagram.
Note	PS9 (a three-wire sensor) plugs into a through-wall connector on the printer’s chassis and then into a 14-pin wire harness, which plugs into J206 on the developing PCB (see Figure 7-21). All signals from the developing PCB are routed to J201 on the developing PCB to J1017 on the DC controller PCB.	
RESETTING MEMORY	The printer is executing a memory reset. The printer returns to the READY state upon completion of this process.	No action required.
RESETTING VALUES FINISHED	The color calibration density values have been reset to their default values.	No action required.
RESTORING FACTORY SETTINGS	The printer is executing a RESTORE FACTORY SETTINGS or a COLD RESET.	No action required.
SELECT LANGUAGE	The language selection power-up key sequence has been entered. The printer will prompt the user to select a new control panel display language once it has completed its initialization process.	Select new language when prompted.
SERVICE MODE	The Service Mode power-up key sequence has been entered. The printer will remain in Service Mode until [Go] is pressed.	Press [Go] to end Service Mode.
TONER CMYK LOW	The toner cartridge specified is low on toner. This message appears if TONER=LOW (default) is set on the printer control panel in the Configuration Menu.	Printing will continue until a TONER OUT message appears. To change the toner cartridge now, press [Select].
TONER CMYK OUT alternates with **PRESS SELECT TO CHANGE TONER**	The toner cartridge specified is out of toner.	Press [Select] to enter the toner replacement mode. Press [Go] to resume printing without changing the cartridge.
TONER CMYK LOW alternates with **PRESS SELECT TO CHANGE TONER**	The toner cartridge specified is low on toner and must be replaced. This message appears when TONER LOW = STOP is set on the front panel in the Configuration Menu.	Press [Select] to enter the toner replacement menu.

Table 7-2 Alphabetical printer error messages (continued)

TONER POSITION [COLOR] = [STATE]	
Description: Indicates the current state of a particular toner cartridge. This message appears when [Select] is pressed while a `TONER LOW/OUT` message appears.	**Action:** If necessary, replace the specified toner cartridge.
TRANSFER KIT LOW **REPLACE KIT (4500)** -or- **TRANSFER KIT LOW** **ORDER KIT (4550)**	
Description: The transfer kit is near the end of its expected life.	**Action:** Continue printing and order Transfer kit. The transfer kit will need to be replaced when the message Transfer Kit Out is displayed.
TRANSFER KIT OUT **REPLACE KIT**	
Description: The transfer kit has reached the end of its expected life.	**Action:** Replace the transfer kit.
TRAY X EMPTY **[TYPE] [SIZE]**	
Description: The specified tray is empty but the current job does not require this tray to complete the job.	**Action:** No action required. However, loading the proper media type and size into the tray will avoid this message in the future.
TRAY X LOAD **[TYPE] [SIZE]**	
Description: The specified media type and size need to be loaded into the requested tray.	**Action:** Load the specified media type and size into the requested tray. Press [Go] to override this request and cause the page to be printed on different media.
TRAY X SIZE **[SIZE]**	
Description: Media has been loaded into the specified tray. The most recently configured size will be displayed with an asterisk next to it.	**Action:** 1. [– Value +] might be used to view all possible media sizes. 2. Pressing [Select] will select the currently displayed size. Pressing [Go] will remove the message.
TRAY X TYPE **[TYPE]**	
Description: Media has been loaded into the specified tray. The most recently configured type will be displayed with an asterisk next to it.	**Action:** 1. [– Value +] might be used to view all possible media types. 2. Pressing [Select] will select the currently displayed type. Pressing [Go] will remove the message.
TRAY X OPEN	
Description: The specified tray is not completely closed.	**Action:** Close the specified tray.
WARMING UP	
Description: The fuser is warming up. Printing will continue when the fuser reaches the optimum temperature.	**Action:** No action required.
WASTE TONER FULL **REPLACE DRUM KIT**	

Table 7-2 Alphabetical printer error messages (continued)

Description:	**Action:**
The waste toner full sensor PS13 detects a waste toner full condition. A light receiver and light pipe arrangement, along with a window in the drum assembly, look for a waste fill condition. Verify that sensors and light pipes are not blocked.	1. Replace the drum kit. 2. Check the sensor, replace it if it’s defective.

Numerical printer error messages

Table 7-3 Numerical printer error messages

13.XX Jam

Note Refer to the jam troubleshooting section for the complete details about locating jams (see page 237).

XX Description:

4500	4550	
0	1	Jam in input feed area
1	5	Jam in fusing area
2	6	Jam in fusing area
3	10	Jam in duplex reversing unit
4	11	Jam in duplex feed unit
5	12	Jam in duplex paper feed area or ITB drawer
6	13	Jam in duplex paper feed area or ITB drawer
7	20	Jam in paper feed area or ITB drawer
8	21	Door open jam
9	23	Irregular jam in paper path
10	24	Paper in the paper path is too short
11	25	Paper in the paper path is too long (see page 237 for complete details)
12	2	Paper did not clear input sensor in time.

Action:

1. Note the location of the leading edge of the first jammed piece of media.
2. Note the jam message.
3. Note the location of the media.

alternates with

CHECK ALL REAR DOORS

Description:	**Action:**
Media is jammed in the rear paper path or rear duplexing area.	1. Open the rear duplex door (if installed) and remove any jammed media. 2. Open the upper rear door and remove any jammed media.

alternates with

CHECK MIDDLE FRONT DOORS

Description:	**Action:**
Media is jammed in the transfer belt area or media is not being picked up properly.	1. Open the ITB drawer and remove any jammed media. 2. Check for media between the transfer roller and the fusing assembly.

alternates with

CHECK FRONT DUPLEX DRAWER

Description:	**Action:**
Media is jammed in the front duplexing area.	Open the duplex drawer and remove any jammed media.

Table 7-3 Numerical printer error messages (continued)

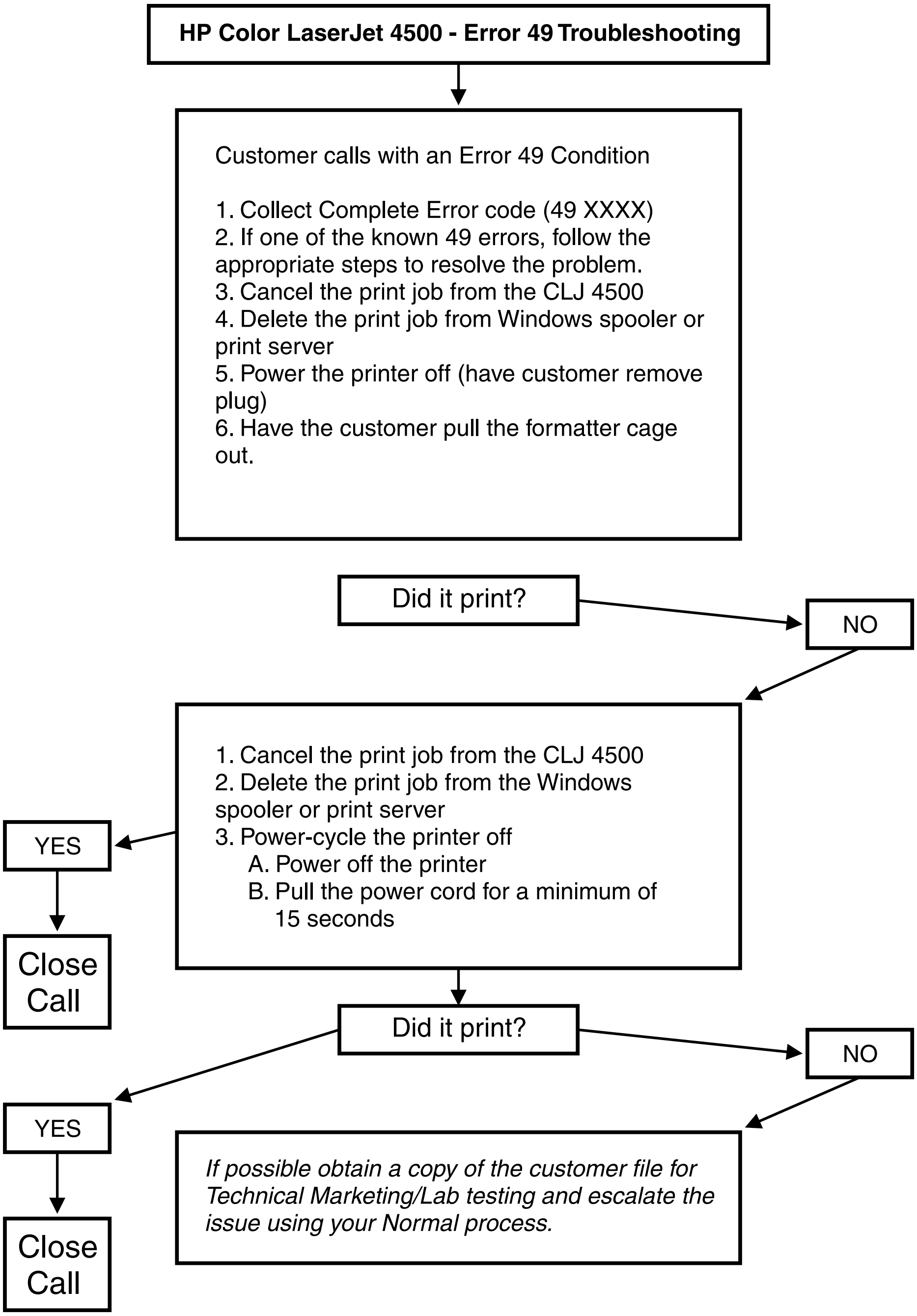
13.0 Jams	
Description: Media is jammed in the front part of the printer immediately after it is picked up.	**Action:** 1. Check to see if the white plastic tabs (located inside the front of the trays under the separation tabs) have fallen off in Tray 2 or Tray 3. (Note the position of the springs.) 2. Make sure that the correct media is loaded properly in Tray 3, and that it is not overloaded. 3. Make sure that the two shipping locks have been removed from the back of Tray 3. 4. Inspect the pick-up rollers for Tray 2; the flat side of the “D” on the rollers should be parallel to the paper. 5. Make sure that the roller spring underneath the front of Tray 2 is secure.
13.1 Jam **OPEN MIDDLE FRONT DRAWER** alternates with **CHECK IN REAR OF DRAWER**	
Description: A jam has occurred inside the ITB drawer area. (The ITB drawer is also referred to as the middle front drawer for end users.) The jam might be located in the fuser area or between the transfer area and the fuser.	**Action:** 1. Open the ITB drawer and carefully inspect for any media. 2. Be sure to inspect the fusing area. You might need to access the fusing area through the rear door. 3. Remove any jammed media. 4. Make sure that the transfer roller is securely in place.
20 INSUFFICIENT MEMORY alternates with **PRESS GO TO CONTINUE**	
Description: More data has been received from the computer than fits in the printer’s internal memory.	**Action:** 1. To continue printing, press [Go]. Only the amount of data that fits in the printer’s internal memory is printed. 2. To cancel the job, press [Cancel Job]. 3. Add more memory to resolve the problem.
22 EIO X BUFFER OVERFLOW alternates with **PRESS GO TO CONTINUE**	
Description: The EIO buffer for the EIO card in slot “X” has overflowed during a busy state.	**Action:** 1. The current data in the print buffer will be lost. 2. Press [Go] to resume printing and then resend the job.
22 PARALLEL I/O BUFFER OVERFLOW alternates with **PRESS GO TO CONTINUE**	
Description: Indicates the parallel buffer has overflowed.	**Action:** 1. The current data in the print buffer will be lost. 2. Press [Go] to resume printing and then resend the job.

Table 7-3 Numerical printer error messages (continued)

40 EIO X DATA ERROR alternates with **PRESS GO TO CONTINUE (4500)** -or- **40 EIO BAD TRANSMISSION (4550)**	**Description:** A connection with the card in the specified slot has been broken.	**Action:** 1. Check that all cables are connected to the EIO ports and that the EIO board is seated properly. 2. If possible, print to another network printer to verify the network is working properly. **Note** All data in the print buffer will be lost.
41.3 UNEXPECTED PAPER SIZE alternates with **CHECK PAPER IN TRAY X (4500)** -or- **41.3 UNEXPECTED PAPER SIZE** alternates with **LOAD TRAY X [TYPE][SIZE] (4550)**	**Description:** A tray is configured for a specific paper size, but the sheet loaded is a different size. This error often occurs when the printer is multifeeding.	**Action:** Load the requested size media in tray.
41.5 UNEXPECTED PAPER TYPE alternates with **CHECK PAPER IN TRAY X**	**Description:** A tray is configured for a specific media type, but the printer detects a different media type loaded. The most common cause for this error is a jam at registration plate (under the ITB) where the customer does not remove the paper. The engine tries to check the OHT sensor and receives an error message.	**Action:** 1. Verify that the correct media type is loaded in the input tray and the printer control panel is configured correctly. 2. Clean the detection windows of OHT sensors 1 and 2 (see Figure 7-24).
49.ERROR XXXX **CYCLE POWER**	**Description:** Indicates that a firmware error occurred that caused the processor on the formatter to abort operation. This type of error can be caused by invalid print commands, corrupt data, or invalid operations. In some cases, electrical noise in the cable can corrupt data during transmission to the printer. Other causes include poor quality parallel cables, poor connections, or home-grown applications. On rare occasions, the formatter is at fault, which is usually indicated by a 79 Service Error. **Note** See the diagram on page 229 for help with troubleshooting 49 errors	**Action:** 1. Turn the printer off and on to reset the printer. 2. Verify that all cables are connected. 3. Cancel all print jobs then resend. Try to isolate any offending print job. 4. Delete the print job from the Windows spooler or from the print server. 5. If the formatter pan assembly or DC controller was removed, make sure the ribbon cable between the DC controller and the interconnect PCB is connected. **Note** The printer control panel will display 49 (FFFF) and the display will be dark if the ribbon cable is not connected. 6. To verify that the formatter is functioning properly, run the formatter tests available in the diagnostics mode (see page 300). If the formatter passes, the formatter is not defective. DO NOT replace the formatter.

Table 7-3 Numerical printer error messages (continued)

Troubleshooting 49 errors


HP Color LaserJet 4500 - Error 49 Troubleshooting

Customer calls with an Error 49 Condition

1. Collect Complete Error code (49 XXXX)
2. If one of the known 49 errors, follow the appropriate steps to resolve the problem.
3. Cancel the print job from the CLJ 4500
4. Delete the print job from Windows spooler or print server
5. Power the printer off (have customer remove plug)
6. Have the customer pull the formatter cage out.

1. Cancel the print job from the CLJ 4500
2. Delete the print job from the Windows spooler or print server
3. Power-cycle the printer off
   A. Power off the printer
   B. Pull the power cord for a minimum of 15 seconds

If possible obtain a copy of the customer file for Technical Marketing/Lab testing and escalate the issue using your Normal process.

Table 7-3 Numerical printer error messages (continued)

49 ADAC or AFAC	**Description:** Indicates that the printer is printing a PostScript file using Windows 3.1 or 9x.	**Action:** No action required.
49 FF01 to FF05	**Description:** An NEC firmware ROM error has occurred.	**Action:** Replace the firmware.
49 FF02	**Description:** Unsupported EDO memory has been installed.	**Action:** Remove unsupported memory.
49 04CC	**Description:** Indicates a media timing issue. This occurs when printing multiple copies of transparencies or heavy or glossy media with either the PCL or PostScript drivers. Or it could indicate a timing mismatch between the engine and formatter.	
49 04E7	**Description:** Occurs during decompression of the strip buffers when the end of the strip marker is missing. This is triggered by one of the following: 1) Marker is corrupt; 2) Strip buffer size given to HiLite is too small; 3) Strip buffer size given is too large. **Note** This error is primarily associated with the firmware and should not require a new formatter.	
49 04FF	**Description:** A large print job (800 to 1200 pages) or complex graphics can cause the printer to quit printing.	**Action:** Two courses of actions are available: ● Determine the page that is causing the failure. If there is an image on the page, try to move the image down on a portrait page or left on a landscape page to move the image out of the strip that is failing. The movements will need to be very small so as not to cause the next strip to fail. ● Put the printer in Lossy mode with a sequence of PJL commands. (Lossy compression is the process of compressing a file such that some data is lost after the file is compressed and decompressed.) Use the following series of commands to put the printer into Lossy mode: ESC%-12345X@PJL @PJL Default Service mode=HPBOISEID @PJL Default Diagnostics=ON @PJL Enter Language = PCL ESC%-12345X@PJL Esc*z9999P Esc*z50P Esc*z201X (Continued on next page)

Table 7-3 Numerical printer error messages (continued)

	● To turn off Lossy mode once the file has printed, use the following commands: ESC%-12345X@PJL @PJL Default Diagnostics=OFF @JPL Default Service Mode=EXIT @PJL EOJ ESC%-12345X@PJL **Note** Putting the printer in Lossy mode might affect performance and print quality
49 FFFF	
Description: Issue reported by life test when replacing the fuser. This error might also occur during the boot cycle.	**Action:** Replace the formatter.
49FFOX	
Description: This error message allows you to scroll through the printer control panel to obtain all of the error information.	**Action:** No action required.
49 OBOA	
Description: A request is not understood. This error message is generated when the I/O card does not support a command that was sent to it.	**Action:** Check the command being sent; the I/O card might not support a particular feature.
49 OB22	
Description: This error message is generated when the I/O card receives a control panel menu action that it does not recognize.	**Action:** Verify the action being sent.
50.x Fuser Error	
Description: The fusing assembly contains two heating bulbs, two thermo-switches, and two thermistors. AC power is provided to the fusing assembly via the DC power supply, which is controlled by the DC controller PCB. The thermistors monitor the temperature of the fusing assembly and provide feedback to the DC controller PCB to regulate the fusing temperature. The two thermo-switches are wired in series with the fusing bulbs, and "open" if the temperature exceeds 240° C (464° F). **X Description:** 1 Low temperature error 2 Fuser warm-up service 3 High fuser temperature 4 Faulty fuser 5 Fuser voltage mismatch (verify that you have NOT installed a 110V fuser in a 220V printer or vice-versa). 6 Fuser heater cutoff 7 Fuser motor malfunction (see recommended action for 50.7 Fuser error)	**Action:** **Note** To visually check if the fusing assembly is functional, you can defeat the rear door interlock switch (see Figure 7-33). Press in on the white plastic above the left rear corner of the fan, then turn on the printer. If the fusing bulbs and thermo-switches are good, you should observe light from the lower fusing bulb as the printer warms up. 1. Turn the printer off and on to reset the printer. If the error persists, try re-installing the fusing assembly. If the error continues to persist, proceed to step 2. 2. Turn the power off and remove the fusing assembly. Measure the resistance between pin 3 and pin 4. The resistance should be between 6+/-2 ohms. If there is no continuity between pins, it can be assumed that either a heating bulb and/or a thermo-switch is "open." Replace the fusing assembly. If resistance limits are acceptable, proceed to step 3. (Continued on next page)

Table 7-3 Numerical printer error messages (continued)

	3. Referring to Figure 7-36, measure the resistance for both the upper and lower thermistors. The resistance should be between 430K ohms and 310K ohms at room temperature (25° C, 77° F). If the resistance exceeds limits, replace the fusing assembly. If resistance is within limits proceed to step 4. 4. Verify the connectors at J1011 of the DC controller PCB and J1 of the DC power supply assembly are firmly seated. 5. Replace the power supply assembly.
50.7 FUSER ERROR	
Description: The fusing motor (M1) drives the fusing assembly, the paper transport (web) assembly, ITB lift mechanism, transfer roller, transfer roller lift mechanism, and the face down output delivery drive assembly. A 50.7 fuser error appears when PS6 detects no motion within the fuser. Photosensor PS6 is the fusing unit pressure switch shown in Figure 7-27.	**Action:** 1. Power cycle the printer to try to clear the message. 2. Remove the left-side cover of the printer. Verify that the fusing motor (M1) connector is seated firmly into J102 of the feed PCB. 3. Ensure that the connector at J110 of the feed PCB is firmly seated (this connector contains the wiring for PS6, which provides fuser-motion feedback). **Note** Closely inspect the mechanical linkage. The gears along the gear “drive” path can bind the gears, which will prevent M1 from rotating. 4. If the error persists, Observe the drive shaft of M1 (refer to Figure 7-31) while powering on the printer. If this shaft DOES NOT rotate, your failure is related to the motor drive circuitry. Referring to the printer’s wiring diagram, verify that connectors J102 and J106 of the feed PCB are firmly seated. If the error still persists, replace the fusing motor and the feed PCB in sequence. 5. If the shaft rotates (both forward and reverse), and the 50.7 fuser error appears, the cause of the error is related to the motion feedback circuitry. Remove the fusing assembly and verify the sensor flag (see Figure 7-27) is in good condition and functional. Verify the connector at sensor PS6 (see Figure 7-27) is firmly seated. Clean the sensor of dust and debris. If the error persists replace sensor PS6.
51 LASER ERROR (4500) -or- **51.X PRINTER ERROR (4550)**	
Description: Indicates a beam detect error or laser failure.	**Action:** 1. Turn the printer off and on to reset the printer. 2. Verify connectors J1102 on the laser driver PCB and J1008 on the DC controller are seated properly. 3. Verify connectors J551 on the beam detect PCB and J1006 on the DC controller are seated properly. 4. Replace the laser/scanner unit.

Table 7-3 Numerical printer error messages (continued)

<table>
<tr><td colspan="2">52 SCANNER ERROR (4500)
-or-
52 PRINTER ERROR (4550)</td></tr>
<tr><td>Description:
Indicates that a scanner error has occurred.</td><td>Action:
1. Turn the printer off and on to reset the printer.
2. Verify connectors J551 on the beam detect PCB, J1103 on the scanner motor, and J1006 on the DC controller are fully seated and connected correctly.
3. Replace the laser/scanner unit.</td></tr>
<tr><td colspan="2">53.XY.ZZ
PRINTER ERROR</td></tr>
<tr><td>Description:
Indicates a memory error. If a DIMM caused the error, the DIMM will not be recognized (configured).

X = MemoryType
0 = ROM
1 = RAM

Y = Device Location
0 = Onboard
1 = DIMM slot 1
2 = DIMM slot 2
3 = DIMM slot 3

ZZ = Error Number
0 = Unsupported memory
1 = Unrecognized memory
3 = Failed RAM test</td><td>Action:
1. Verify that the DIMM is installed correctly.
2. Turn the printer off and on to reset the printer.
3. Remove and replace the DIMM that caused the error.</td></tr>
<tr><td colspan="2">54.1 PRINTER ERROR</td></tr>
<tr><td>Description:
Indicates that an internal power failure has occurred.</td><td>Action:
1. Turn the printer off, and then turn the printer back on.
2. Replace the high-voltage power supply.
3. Check the fuser to ensure jams have not occurred.

CAUTION 54.1 errors can be caused by damaging the thermistor while clearing fuser jams.

4. Make sure there is not a fluctuation in the power supply to the printer. Check that the electrical specifications (see Chapter 1) are met.
5. Replace the low-voltage power supply.</td></tr>
<tr><td colspan="2">54.2 PRINTER ERROR</td></tr>
<tr><td>Description:
Indicates that a problem exists with the carousel assembly. Either the carousel is not rotating or the sensor has failed. Drive motor (M3) provides drive for the toner cartridge carousel. If motion is not detected, a 54.2 error appears. M3 is a 6-phase stepping motor and receives its drive signal from J203 of the developing PCB. Photosensor PS10 monitors “movement” (and the position) of the toner cartidge carousel. Different width tabs (four tabs, one for each cartridge) on the left-end of the

(Continued on next page)</td><td>Action:
1. Turn the printer off and then on to reset the printer.
2. Open the color toner door and look for an obstruction. If necessary, remove the toner cartridges individually by manually releasing the carousel brake and rotating the carousel around to each cartidge position and removing the cartridges. Turn the printer off and on to reset the printer.

(Continued on next page)</td></tr>
</table>

Table 7-3 Numerical printer error messages (continued)

carousel housing pass through PS10 to provide positioning information. The black toner cartridge tab is the home position. Toner cartridge position within the carousel is monitored by PS11. If PS11 fails or is improperly connected, a 54.2 error appears. Another indicator of this is that the carousel starts to rotate then stops immediately. A 54.2 error message can also occur if the sensor is installed backwards.	**Note** The printer CANNOT operate with the top cover removed unless the carousel brake has been released or removed. 3. Verify the carousel drive motor wiring harness is firmly seated into connector J203 of the developing PCB (see Figure 7-38). 4. Verify PS10 (refer to Figure 7-31) is working correctly and not excessively dirty (clean if necessary) and that the wiring harness is firmly seated into both the sensor assembly and connector J206 of the developing PCB. 5. Verify PS11 is connected and functioning properly. 6. Verify all connectors to the developing PCB and the DC controller PCB are firmly seated. 7. Verify that the rotary drive assembly is working. Replace it on older units with more than 50K of life. **Note** The following URL provides help with cartridge installation and removal: http://www.hp.com/go/ljsupplies.
54.3 PRINTER ERROR	
Description: The printer is not receiving data back from the density sensor (PS14). PS14 is located in the bottom of the imaging drum drawer (refer to Figure 7-30). During calibration routines, a series of images are written on the imaging drum and the densitometer measures the density of the image (e.g. amount of toner that is placed into the drum). These measurements provide the feedback to ensure image quality is consistent throughout the life of the consumable.	**Action:** 1. Verify the densitometer is clean; perform the toner density sensor cleaning procedure in Chapter 7 of the online user guide. 2. Inspect the density sensor wiring harness for damage. The harness runs from the density sensor through the left-side upper control arm of the imaging drum drawer to J1010 of the DC controller PCB. Verify that the cable is firmly seated into the J1010 of the DC controller PCB. 3. If the error persists, replace the density sensor assembly.
54.4 PRINTER ERROR	
Description: Optional equipment is not recognized.	**Action:** Turn the printer off and on to reset the printer.
54.5 PRINTER ERROR	
Description: Indicates a waste toner sensor malfunction.	**Action:** 1. Turn the printer off and on to reset the printer. 2. Remove the drum cartridge and clean the waste toner detection window with a dry cloth. 3. Clean the waste toner sensor unit at the printer side with a dry cloth. 4. Check the light guide and clean it if necessary. Replace the light guide if the ends are scarred. 5. Reconnect the waste toner sensor unit connector and the DC controller PCB connector (J1009) correctly. 6. Replace the waste toner sensor (PS13).

Table 7-3 Numerical printer error messages (continued)

54.6 PRINTER ERROR	**Description:** The OHT sensor has reported an error condition. This can be caused by contamination in the connectors, a blocked sensor, or a defective sensor. See Figure 7-24 for the sensor locations.	**Action:** 1. Remove the ITB and verify that the OHT sensor prism is in place. 2. Lift the registration flap and verify that the OHT sensor is not blocked. 3. Remove the ITB drawer and inspect the drawer connectors for contamination such as a piece of paper. 4. If the error persists, verify that all connectors are firmly seated. 5. Replace ITB drawer.
55 DC CONTROLLER ERROR	**Description:** The print engine is not communicating with the formatter. The communication link between the formatter and DC controller was lost. This can occur due to a timing error or intermittent connection between the formatter and DC controller.	**Action:** 1. Turn the printer off and on to reset the printer. 2. Reseat the connectors between the formatter and DC controller. 3. Only if the error persists, replace the DC controller making sure to perform the calibration and color plane alignment procedures.
57.1 FAN FAILURE	**Description:** The printer detected that the fan (an exhaust fan located in the upper, left rear corner of the printer, refer to Figure 7-34) was not rotating. This fan operates off +24Vdc and is enabled by the DC controller PCB’s microprocessor.	**Action:** 1. Turn the printer off and on to reset the printer. Visually check to see if the fan is rotating (if you cannot see any rotation, place your hand over the outlet vents to see if exhaust air is moving). 2. Remove the printer’s left-side cover. Check to see if anything is preventing the fan from rotating freely. 3. Verify that the fan’s connector is firmly seated into connector J208 of the developing PCB. 4. If the error persists, replace the fan.
57.2 FAN FAILURE	**Description:** The printer detected that the fan (an exhaust fan located in the upper, right rear corner of the printer, refer to Figure 7-34) was not rotating. This fan, operates off +24Vdc and is enabled by the DC controller PCB’s micro-processor.	**Action:** 1. Turn the printer off and on to reset the printer. Visually check to see if the fan is rotating (if you cannot see any rotation, place your hand over the outlet vents to see if exhaust air is moving). 2. Remove the printer’s left-side cover. Check to see if anything is preventing the fan from rotating freely. 3. Verify that the fan’s connector is firmly seated into connector J208 of the developing PCB. 4. If the error persists, replace fan.
57.3 FAN ERROR alternates with **CLOSE UPPER FRONT DRAWER**	**Description:** The intake fan is located in the front, center of the drum drawer (refer to Figure 7-32). (The drum drawer is referred to as the upper front drawer for end users.) Fan rotation stops when the drawer is opened. A fan error message appears when fan motion is NOT detected by the DC controller’s (Continued on next page)	**Action:** 1. Turn the printer off and on to reset the printer. Due to the difficulty of observation, listen to hear if the fan is rotating. 2. Verify FM3 connector 27 (callout #3 in Figure 7-32) is not damaged or broken. (Continued on next page)

Table 7-3 Numerical printer error messages (continued)

micro-processor if the drawer is closed and the printer is not in PowerSave mode.	3. Verify the fan connector is firmly seated into connector J1022 of the DC controller PCB. 4. If the error persists, replace the fan.
62 NO SYSTEM **Description:** Indicates there is a printer firmware problem. Either there is no firmware DIMM installed or the DIMM has failed. If the formatter was just replaced, make sure all DIMMs have been moved from the old formatter to the new one.	**Action:** 1. Turn the printer off and on to reset the printer. 2. Reseat the firmware DIMM, making sure it is in the slot surrounded by a white line with the text “ROM ONLY IN THIS SLOT.”
62.X PRINTER ERROR **Description:** Indicates that a problem exists with the internal memory. **X = Description** 0 = Internal memory 1-3 = DIMM slots 1 through 3.	**Action:** 1. Turn the printer off and on to reset the printer. 2. Reseat and then replace the DIMM. 3. Replace the formatter board.
62.M BAD MPTR **Description:** The firmware ran out of memory trying to build the static entity directory.	**Action:** 1. Check printer settings to determine which values have been changed. 2. Clear the message by pressing [Go].
68 NVRAM ERROR **CHECK SETTINGS** **Description:** One or more settings saved in the non-volatile storage device are invalid. Some settings might have been reset to factory defaults.	**Action:** 1. Check printer settings to determine which values have been changed. 2. Clear the message by pressing [Go].
68 NVRAM FULL **CHECK SETTINGS** **Description:** Indicates that a non-volatile storage device is full. Some settings might have been reset to factory defaults.	**Action:** 1. Check printer settings to determine which values have been changed. 2. Clear the message by pressing [Go].
79 SERVICE (XXXX) **PRINTER ERROR** **Description:** A hardware error has occurred. **X=Description** 01XX = IO ASIC register error 02XX = video ASIC register error 03XX = IDE ASIC register error	**Action:** 1. Reseat the formatter. 2. Reseat the firmware DIMM. 3. Run formatter diagnostics. 4. Replace the firmware DIMM. 5. Replace the formatter.
80 SERVICE (XXXX) **EIO ERROR** **Description:** A critical EIO failure has occurred. X indicates the slot number of the device. XXXX indicates the error type.	**Action:** 1. Turn the printer off and on to reset the printer. 2. Reseat the EIO card. 3. Replace the EIO card.

Paper path troubleshooting

Jams

Jam error messages appear if paper fails to arrive at or clear the paper path sensors in the allowed time. Dedicated paper sensors (PS2, PS7, PS3101, PS3103, and PS3104) detect whether paper is present in the sensor and if the paper is fed normally (see Figure 7-3). When the control board detects a jam, it immediately stops the printing process and displays the appropriate jam message for the sensor that detects the jam.

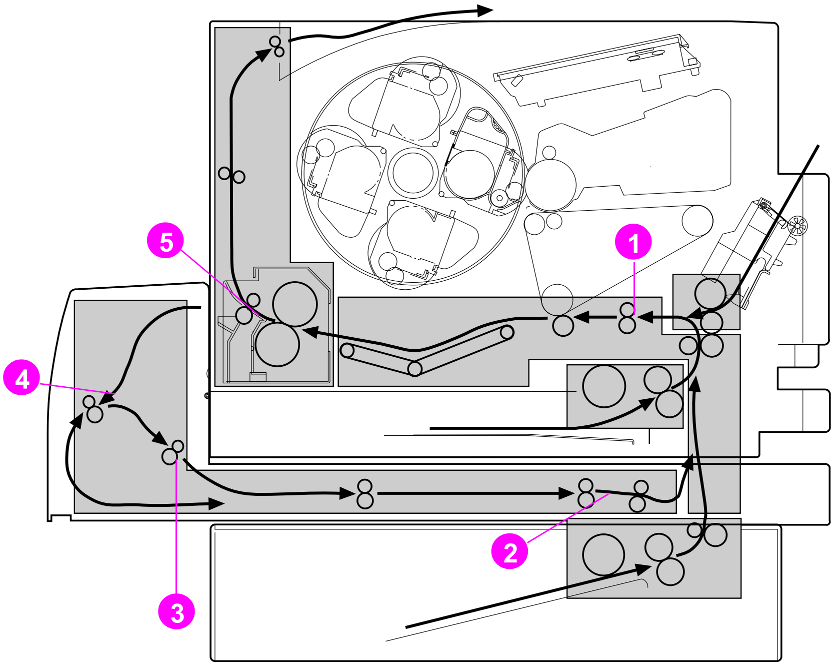


Figure 7-3 **Jam sensors (shown with the optional 500-sheet paper feeder and duplex unit installed)**

1. Registration paper sensor (PS2)
2. Duplex paper-pick sensor (PS3104)
3. Duplex pick-up sensor (PS3103)
4. Reversed paper sensor (PS3101)
5. Delivery paper sensor (PS7)

Jam locations

Use Figure 7-4 to troubleshoot jams in the printer. For instructions on clearing jams, see the sections later in this chapter.

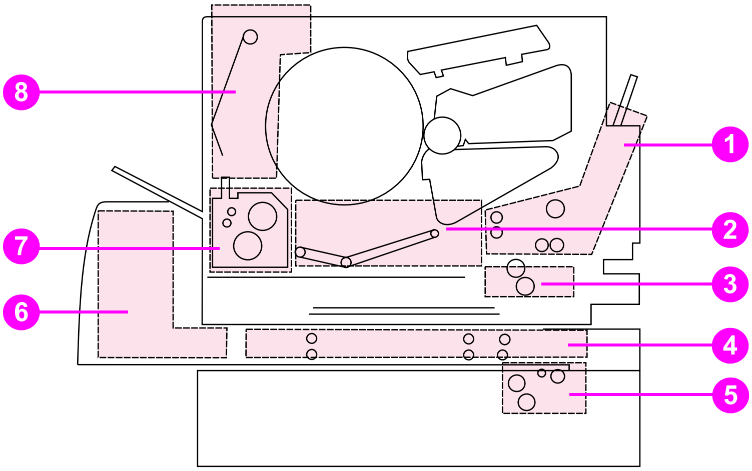


Figure 7-4 **Jam locations (shown with the optional 500-sheet paper feeder and duplex unit installed)**

1 Tray 1 input area
2 Transfer belt area
3 Tray 2 input area
4 Front duplex drawer area
5 Tray 3 (500-sheet paper feeder) area
6 Rear duplex cover area
7 Fuser area
8 Rear paper path area

Jam locations by error message

Use Figure 7-5 and Table 7-4 to troubleshoot jams by the error message received. For instructions on clearing jams, see the sections later in this chapter.

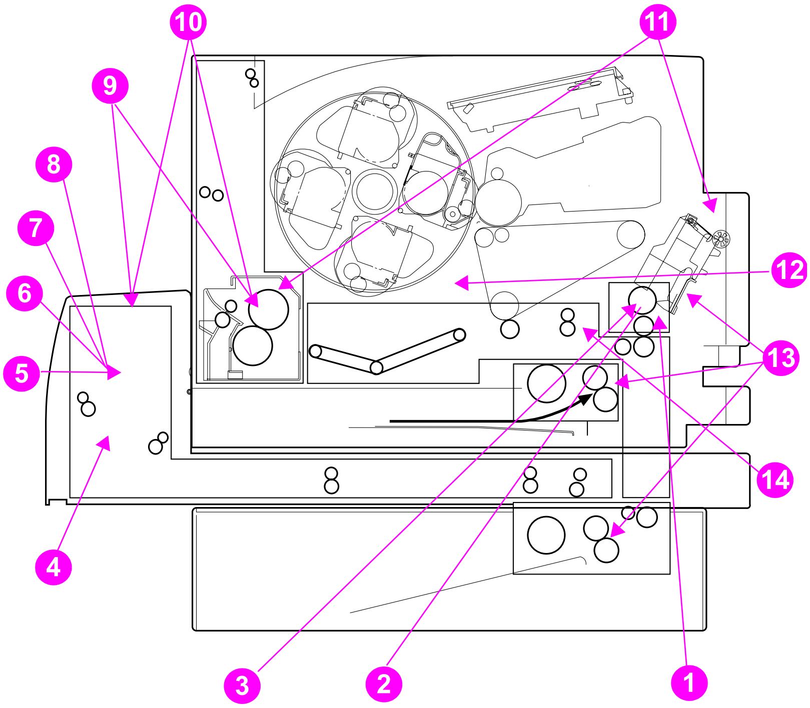


Figure 7-5 Jam locations by error message

See the next page for the Color LaserJet 4550 associated error messages.

Table 7-4 HP Color LaserJet 4500 jam locations and associated error messages

1	13.11 Paper in the paper path is too long. Check the Tray 1 area. Check the entire paper path.	8	13.3 Jam in duplex reverse unit. Inspect the rear of the duplex unit and the duplex tray.
2	13.10 Paper in the paper path is too short. Check the Tray 1 area. Check the entire paper path.	9	13.2 Jam in fusing area. Check the fuser assembly, output assembly, and duplex unit.
3	13.9 Irregular jam in the paper path. Check the Tray 1 area. Check the entire paper path.	10	13.1 Jam in fusing area. Check the fuser assembly, output assembly, and duplex unit.
4	13.8 Door-open jam. Check the rear door, duplex cover, and rear output door. 13.7 Jam in paper feed area. Check the entire paper path. Loose toner or paper dust on the density sensor can cause this error. Clean the sensor.	11	13.1 Jam. `OPEN MIDDLE FRONT DRAWER` alternates with `CHECK IN REAR OF DRAWER`. Check the middle front drawer. Check and pull out the fuser.
5	13.6 Jam in duplex paper feed area. Inspect the rear of the duplex unit and the duplex tray.	12	13.1 Jam: Check in rear of drawer. Check the rear of the middle front drawer. Reseat the transfer roller.
6	13.5 Jam in duplex paper feed area. Inspect the rear of the duplex unit and the duplex tray.	13	13.0 Jam in input feed area. Check the input trays and duplex unit.
7	13.4 Jam in duplex unit. Inspect the rear of the duplex unit and the duplex tray.	14	13.12 Paper did not clear the input sensor in time.

Table 7-5 HP Color LaserJet 4550 jam locations and associated error messages

1	13.25 Paper in the paper path is too long. Check the Tray 1 area. Check the entire paper path.	8	13.10 Jam in duplex reverse unit. Inspect the rear of the duplex unit and the duplex tray.
2	13.24 Paper in the paper path is too short. Check the Tray 1 area. Check the entire paper path.	9	13.6 Jam in fusing area. Check the fuser assembly, output assembly, and duplex unit.
3	13.23 Irregular jam in the paper path. Check the Tray 1 area. Check the entire paper path.	10	13.5 Jam in fusing area. Check the fuser assembly, output assembly, and duplex unit.
4	13.21 Door-open jam. Check the rear door, duplex cover, and rear output door. 13.20 Jam in paper feed area. Check the entire paper path. Loose toner or paper dust on the density sensor can cause this error. Clean the sensor.	11	13.5 Jam. `OPEN MIDDLE FRONT DRAWER` alternates with `CHECK IN REAR OF DRAWER`. Check the middle front drawer. Check and pull out the fuser.
5	13.13 Jam in duplex paper feed area. Inspect the rear of the duplex unit and the duplex tray.	12	13.5 Jam: Check in rear of drawer. Check the rear of the middle front drawer. Reseat the transfer roller.
6	13.12 Jam in duplex paper feed area. Inspect the rear of the duplex unit and the duplex tray.	13	13.1 Jam in input feed area. Check the input trays and duplex unit.
7	13.11 Jam in duplex unit. Inspect the rear of the duplex unit and the duplex tray.	14	13.2 Paper did not clear the input sensor in time.

Table 7-6 Explanation of alternating message

Check middle front doors	● Check middle front drawer. ● Watch pick roller to ensure it is turning.
Check all rear doors	● Check duplex cover. ● Check upper rear door and rear output door.
Check front duplex drawer	● Check front duplex drawer.

General paper-path checklist

❏ Verify that media is correctly loaded in the input trays and that all length and width guides are set correctly.

❏ Clean the printer. Toner and paper dust in the paper path inhibit free movement of media through the printer and block the sensors.

❏ Vary the input and output selections of the printer to determine if the problem is associated with a particular area of the printer.

❏ Worn separation pads on the multipurpose tray can cause multifeeds. Check the condition of the pickup rollers and customer replaceable feed roller. Bent separation tabs can cause misfeeds and multifeeds. Replace the tray if necessary.

❏ Defective paper tray switches can cause jams by communicating the wrong size paper to the formatter.

❏ Scraps of media left in the paper path can cause intermittent jams. Always check that the paper path is clear when cleaning the printer and when clearing jams. Also, remove the fuser and carefully check it for jam debris.

❏ There are five areas in which jammed scraps can be difficult to find:

  - The ITB drawer connector on the engine side.
  - The OHT sensor under the registration plate.
  - The fuser; remove the fuser to check it carefully.
  - The center of the web transport before the fuser.
  - Inside the ITB; Rotate the belt by rotating the two white knobs on either side of the ITB to clear jam debris.

Print media checklist

Many print problems are caused by printing on media that does not meet specifications. The *HP LaserJet Printer Family Print Media Guide* contains detailed information about media specifications (see page 325 for ordering information). Refer to the following list for common media-related printing problems.

❏ Rough paper causes poor toner transfer and smeared print problems. Check that the paper meets specifications for smoothness.

❏ The printer handles only 60 to 176 g/m^2 (16 to 47 lb) bond media when the media is less than or equal to 148 mm (5.8 inches) wide. If the media is more than or equal to 148 mm (5.8 inches) wide, the printer can handle only 60 to 135 g/m^2 (16 to 36 lb) bond. Use transparencies that are 0.13 mm (5-mil) thick.

❏ Paper that has absorbed moisture causes paper feed problems. When the printer is used in a humid area, damp paper might be the cause of recurring paper feed and print quality problems.

❏ Damaged paper, paper with ragged edges, or paper whose edges stick together cause jams.

❏ Using paper that has already been through a laser printer or a copier can cause jams.

❏ Print quality can degrade if media with a high resistivity is being used, specifically when duplexing.

Jam recovery

This printer provides a jam recovery feature that allows you to set the printer to automatically attempt to recover from jams. All pages affected by the jam will be reprinted if the jam recovery feature is enabled. The options are:

`ON`	Printer will attempt to reprint jammed pages.
`OFF`	Printer will not attempt to reprint jammed pages.

Note During the recovery process, the printer might reprint several good pages that were printed before the jam occurred. Be sure to remove any duplicated pages.

To enable jam recovery

1. Press [MENU] until `CONFIGURATION MENU` appears.
2. Press [ITEM] until `JAM RECOVERY` appears.
3. Press [VALUE] until `ON` appears.
4. Press [SELECT] to save the setting.
5. Press [GO] to return the printer to the `READY` state.

To improve print speed, you might want to disable jam recovery. To disable jam recovery, select `OFF` in step 3 above. If jam recovery is disabled, the pages involved in a jam will not be reprinted.

Image formation troubleshooting

The image formation system (Figure 7-6) consists of the following imaging units:

- photosensitive drum cartridge carousel
- laser/scanner
- toner cartridges
- intermediate transfer belt (ITB) unit
- secondary transfer roller

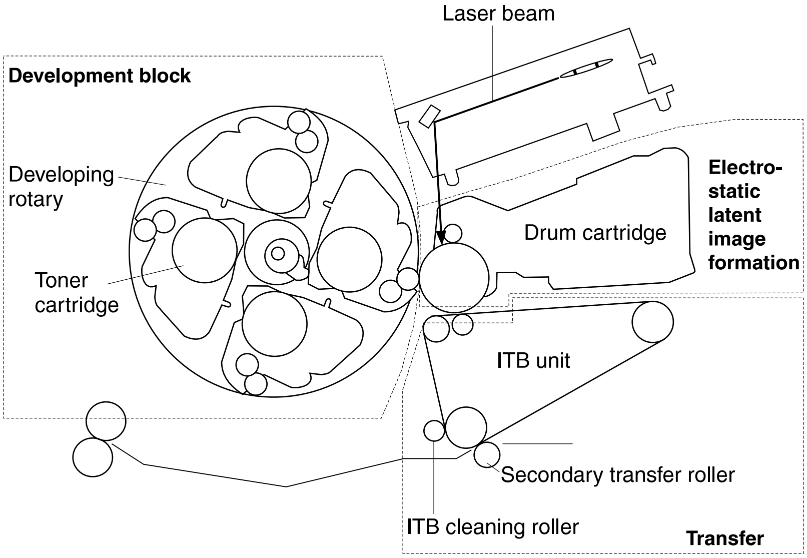

Laser beam
Development block
Developing rotary
Toner cartridge
Drum cartridge
Electro-static latent image formation
ITB unit
Secondary transfer roller
ITB cleaning roller
Transfer

Figure 7-6 **Image formation**

Before beginning image formation troubleshooting, check that the media meets the specifications listed in the *HP LaserJet Printer Family Print Media Guide.*

Print density test and color checks

Use the configuration page to check the print density of the black, primary, and process color levels. Solid black and color-filled areas on the configuration page demonstrate the ability to print at full density. To print a configuration page, see page 287.

In addition to the items listed above, the configuration page provides the following information:

- It helps isolate the problem to the software or the printer.
- It shows that all colors print.

The following media-related items are responsible for many image formation and print-quality defects:

- rough paper
- heavy paper
- transparencies out of the specified thickness range
- paper that has absorbed too much moisture from the atmosphere
- room environment (humidity too high or low)

Understanding color variations

The printed output might not match the computer screen, and the colors printed on successive pages might not match. While color variations are inherent in this printing method, they can indicate changes in the printing environment, print media, or printer components.

Common causes of color variation

The following list outlines the major causes of color variations between computers, applications, and output devices.

- Halftone patterns produced on monitors and the types of patterns used in the print jobs are different and might cause variations in the printed output.
- The printed output differs from the image on the monitor because the monitor and the print media have different reference values of black and white. The monitor screen has charcoal gray for the black level, and the white on the monitor screen is actually blue. Black on the print media is limited only by the fill capability of the printer, and most good quality paper has a very high white level. In addition, phosphor (used in color monitors) and toner have entirely different spectra characteristics and different color-rendering capabilities. Differences between output are common. Blues generally match better than reds.
- The color of the ambient light changes the perception of color. Fluorescent light lacks many colors present in incandescent light, and the color range of natural light is broader than any artificial light. When comparing color, choose a standard light source for reference and understand that the perceived color will change as the light changes.
- Long-term color variations occur as paper ages. Use high-quality paper and protect the paper from sunlight to help minimize discoloration.
- Environmental changes can cause color variation. The development process places a high potential across an air gap to attract toner to the imaging drum. Changes in relative humidity vary the point at which the toner travels to the imaging drum.
- All consumable components have a finite life span. As these components reach the end of their useful life, their ability to produce consistent print quality diminishes.
- Paper roughness can cause colors to look different. Use standard paper.

Color selection process

The user selects the color in the application, but the operating system might convert or modify some characteristics of the color before sending the information to the printer driver. The printer driver might also modify color characteristics depending upon the selected output mode.

Any color characteristics not addressed by the printer driver or applications are set to the printer default. The default color might not match the color the user selected.

Customizing color output through printer drivers

The printer driver, which is installed with your printer software, enables your software applications to use the features of the printer. It also gives you customized control of color text, graphics, and photos.

The method of using your printer driver depends on your computer's operating system. For specific instructions about using printer drivers, see the printer driver's Readme file, which is included on the printing system CD-ROM.

The following color control features are available only through your HP printer driver. See the printer driver's online Help for details about color settings and their effect on printed output.

Halftone options

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photos independently. The two halftone options are Smooth and Detail.

The Smooth option provides better results for large, solid-filled print areas. It also enhances photos by smoothing out fine color gradations.

The Detail option is useful for text and graphics that require sharp distinctions among lines or colors, such as images that contain a pattern or a high level of detail.

HP ColorSmart II

HP ColorSmart II is a set of technologies that enables optimal color output automatically for diverse types of documents.

HP ColorSmart II utilizes object tagging and Standard RGB (sRGB) color technologies. Object tagging allows optimal color and halftone settings to be used for different objects on a page (text, graphics, and photos). The printer analyzes objects the page contains and intelligently uses halftone and color settings that provide the best print quality for each object. Object tagging, combined with optimized default settings, produces great color out of the box.

In the Windows environment, you will find the HP ColorSmart II **Automatic** and **Manual** settings on the Color tab in the printer driver.

Color management options

Print in grayscale

Selecting the **Print in Grayscale** option in the printer driver allows you to print your document in black and white. This option is useful for previewing preliminary copies of slides and hardcopy output for color documents that will be photocopied or faxed.

Automatic color adjustment

The **Automatic** color adjustment feature of HP ColorSmart II (the default setting) optimizes the color and halftones used for each element of a document. **Automatic** also provides additional color options for application and operating systems that support color management systems. For more information, see your printer driver online Help.

Note **Automatic** is the default setting and is recommended for printing all color documents.

Manual color adjustment

The **Manual** color adjustment feature of HP ColorSmart II allows you to adjust the color and halftone modes for text, graphics, and photographs. To use the **Manual** color options from the Color tab, select **Manual**, then select **Options**.

Halftone options

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photos independently. The two halftone options are **Smooth** and **Detail**.

- The **Smooth** option provides better results for large, solid-filled print areas. It also enhances photos by smoothing out fine color gradations.
- The **Detail** option is useful for text and graphics that require sharp distinctions among lines or colors, or images that contain a pattern or a high level of detail.

Color map

The color map settings in the printer driver tell the printer how to interpret the data sent from a software application into the final colors that the printer will print. The color map settings can be adjusted to **Screen match** or **Vivid**.

- **Screen Match** (sRGB — standard red-green-blue) prints colors that are optimized to match RGB monitor colors. Use this setting to more closely match the colors on your screen.

  A world-wide color standard originally developed by HP and Microsoft, sRGB is a common color language for monitors, input devices (scanners, digital cameras), and output devices (printers, plotters). It is the default color space used for HP products, Microsoft operating oystems, the World Wide Web, and most office software sold today. sRGB is representative of the typical Windows computer monitor today and the convergence standard for High-Definition Television.

Note Factors such as the type of monitor you use and the room's lighting can affect the appearance of colors on your screen.

The latest versions of Adobe PhotoShop, CorelDRAW™, Microsoft Office, and many other applications use sRGB to communicate color. Most importantly, as the default color space in Microsoft Operating Systems, sRGB has gained broad adoption as a means to exchange color information between applications and devices using a common definition that ensures typical users will experience greatly improved color matching. sRGB combined with HP ColorSmart II improves the user's ability to match colors between the printer, the computer monitor, and other input devices (scanner, digital camera) automatically.

- **Vivid** enhances the saturation of the printed colors to produce a vivid color appearance. For more information, see your printer driver online Help.

Matching colors

The process of matching printer output color to your monitor is quite complex because printers and computer monitors use different methods of producing color. Monitors *display* colors by light pixels using an RGB (red, green, blue) color process, but printers *print* colors using a CMYK (cyan, magenta, yellow, and black) process.

Several factors can influence your ability to match printed colors to those on your monitor. These factors include:

- Print media
- Printer colorants (inks or toners for example)
- Printing process (inkjet, press or laser technology for example)
- Overhead lighting
- Personal differences in perception of color
- Software applications
- Printer drivers
- PC operating system
- Monitors
- Video cards and drivers

For most users, the best method for matching colors on your screen to your printer is to print sRGB colors. The HP Color LaserJet 4550 uses HP ColorSmart II, which uses sRGB and automatically optimizes color output. Keep in mind the above factors when colors on your screen do not perfectly match your printed colors.

Four-color printing (CMYK)

Cyan, magenta, yellow and black (CMYK) are the inks used by a printing press. The process is often called four-color printing. CMYK data files are typically used by and originate from graphic arts (printing and publishing) environments. The HP Color LaserJet 4550 series printer is optimized to print RGB colors for a good match to the screen, but will also accept CMYK colors through the PostScript printer driver. By default, the HP Color LaserJet 4550 series printer interprets CMYK data according to the Standard Web Offset Press (SWOP) standard. This standard defines how a particular set of CMYK inks should behave. The printer performs a SWOP color map and internal half-tones to emulate a SWOP CMYK press. Emulations for Dainippon Press (DIC) and Euro-standard CMYK inks used in the Far East and Europe are also available, and can be selected from the printer driver.

Matching PANTONE® colors

The PANTONE® Matching System colors are specified as CMYK colors as supported in many graphics software applications. This color-matching system is useful for matching printer output to a specific color (for example, a logo). See the documentation for your software application for instructions on using PANTONE® colors.

For more information about using PANTONE® colors, see the Readme file for the PANTONE® color-matching system included on the printing system CD-ROM.

Note Color settings, halftone settings, and print media affect the appearance of PANTONE® colors. To optimize PANTONE®-certified colors, use the default PostScript 3 emulation driver settings and HP LaserJet paper.

Automatic PANTONE ® calibration

Automatic PANTONE® calibration generates high-quality PANTONE® colors from the PANTONE® color name automatically, providing the best possible color calibration in the HP Color LaserJet 4550 printers. An example of a PANTONE® name is: PANTONE® 286CVC. When printing PANTONE colors, Automatic PANTONE® calibration is the default setting for HP Color LaserJet 4550 printers.

This feature automatically converts PANTONE® colors to optimal color values for the HP Color LaserJet 4550 using the PANTONE® color name in the data stream sent to the printer.

Most application programs that support the use of PANTONE® colors for graphic objects will include the PANTONE® name in the PostScript output, along with the color values assigned to the object.

The HP Color LaserJet 4550 printer will recognize the PANTONE® name and substitute the optimum color values for the printer based on color tables developed to provide the best possible match for each specific PANTONE ® color within the printer’s color gamut.

No special actions are necessary in the application program or the driver to enable this feature. You have the option of turning off Automatic PANTONE® calibration if you want to use application-generated color values rather than HP-generated color values.

To turn off Automatic PANTONE® calibration:

- In Windows, go to **Properties**, **Advanced**, and then **Printer Features**.
- On a Macintosh, go to the **CMYK Inks** page of the driver interface.

These applications are known to generate PostScript files with graphic objects preserving the PANTONE® name:

- Adobe Illustrator 7 and 8
- Adobe PageMaker 6.5
- CorelDRAW 7, 8, and 9
- Deneba Canvas 5 (see note)
- Macromedia Freehand 7 and 8
- Micrografx Designer
- QuarkXpress 3 and 4

Note Subsequent versions of Deneba Canvas no longer generate compatible PANTONE® names. Microsoft Publisher 2000 adds support for PANTONE® colors but does not preserve the PANTONE® name necessary for this feature to work.

The Automatic PANTONE® calibration feature only applies to vector graphics, not picture (raster) data such as scanned images and TIFF files. Adobe PhotoShop, for example, being a raster image editor, is not on the above list of applications that support the Automatic PANTONE® calibration feature.

WWW PANTONE® palettes for some raster image editor applications, such as Adobe PhotoShop, are available on the Web at http://www.hp.com/support/lj4550. Once connected, select Downloads and Drivers. Printer drivers, ICC color profiles, and sRGB color swatches are also available at this Web address.

PANTONE® Application Palettes are available for:

- Adobe Illustrator 4–8
- PageMaker 5, 6, and 6.5
- PhotoShop 3–5.5
- CorelDRAW 6–9
- Micrographics Designer 6–7
- Macromedia Freehand 4–8
- QuarkXpress (as EPS files) 3.3–4.04
- Deneba Canvas 3.5–6.1
- Fractal Design Painter 2–5.5
- EPSF Charts
- TIFF Charts
- PANTONE® Color Drive
- Text Format (ASCII)
- Raw PostScript File
- Adobe Acrobat

Vector graphics such as company logos created in one of the above applications (using palettes or applications that preserve the PANTONE® name) can be imported into Microsoft Word, PowerPoint and other MS Office applications. To do this, the color application must create an Encapsulated PostScript (EPS) file of the image to be inserted as a file into the Office document using the insert file function.

Note Cutting and pasting from the clipboard will not work. These tasks do not preserve the PANTONE® name or the CMYK palette value.

Some of the PANTONE® colors will not match exactly. There are over 945 PANTONE® colors in the PANTONE® Matching System. These colors were created using sixteen inks on a lithographic printing press. Not all of these colors can be reproduced by a laser color printer because they are out of a laser printer's four-color range. PANTONE® calibrates HP printers to provide the closest match for all the colors we can reproduce and provide the colors closest to those we cannot reproduce.

Note This feature requires the use of the PostScript 3 Emulation printer driver. It utilizes a function in the PostScript language for describing custom colors like PANTONE® that is unique to PostScript and not present in the PCL data stream. PANTONE® colors are used mostly in publishing environments by applications such as QuarkXpress and Adobe InDesign that tend to use PostScript only.

Adjusting color balance

This printer features automatic color calibration to provide high-quality color output. In situations that require critical color control, you can manually adjust the density balance of the printer’s four toner colors.

CAUTION This procedure should only be performed by your network administrator. Performing this procedure changes the color balance of the printer by altering halftones and affects *all* print jobs.

To adjust color balance

Step 1: Print a color balance calibration page.

The color balance calibration page (shown in Figure 7-7) displays current color settings and provides a record of the printer’s initial settings before any adjustments are made.

1. Press [MENU] until `CALIBRATION MENU` displays.
2. Press [ITEM] until `PRINT CALIBRATION PAGE` displays.
3. Press [SELECT] to print the color balance calibration page. The page consists of four color bars (cyan, magenta, yellow, and black) and a box containing gray balance circles. The factory default setting for each color is zero. The range of settings is -5 to +5.

Note Adjusting densities using the four color bars provides coarse color balance adjustments. After making these adjustments, you can fine-tune color densities by adjusting the gray balance. (See step 7 for instructions.)

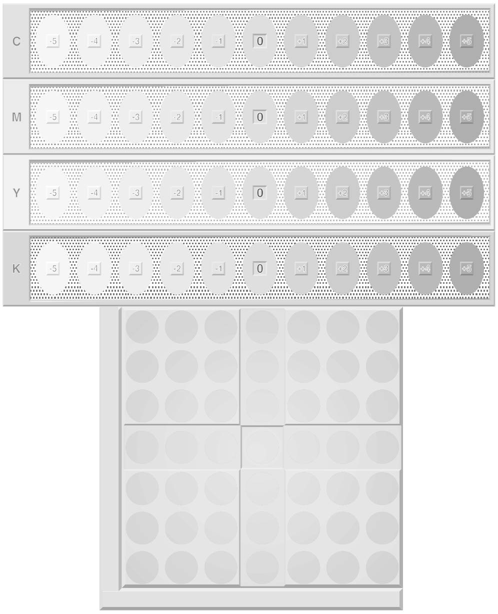


Figure 7-7 Color balance calibration page

Step 2: Adjust the cyan (C) density setting.

Examine the cyan density bar (C) on the color balance calibration page from a distance of 2 meters (6 ft). If the center oval matches the background pattern more than the other ovals, the cyan density does not need to be adjusted, and you should continue to the magenta (M) setting. If an oval left of center or right of center matches the background more than the center oval, use the following steps to enter the number:

1. Press [ITEM] until CYAN DENSITY appears.
2. Press the right side of the [VALUE] key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern appears.
3. Press [SELECT] to save the value. An asterisk (*) appears next to the selected setting.

Step 3: Adjust the magenta (M) density setting.

Examine the magenta density bar (M). If the center oval matches the background pattern more than the other ovals, the magenta density does not need to be adjusted and you should continue with the next step. If not, use the following steps to adjust the density:

1. Press [ITEM] until MAGENTA DENSITY appears.
2. Press the right side of the [VALUE] key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern appears.
3. Press [SELECT] to save the value. An asterisk (*) appears next to the selected setting.

Step 4: Adjust the yellow (Y) density setting.

Examine the yellow density bar (Y). If the center oval matches the background pattern more than the other ovals, the yellow density does not need to be adjusted and you should continue with the next step. If not, use the following steps to adjust the density:

1. Press [ITEM] until YELLOW DENSITY appears.

2 Press the right side of the [VALUE] key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern appears.

3 Press [SELECT] to save the value. An asterisk (*) appears next to the selected setting.

Step 5: Adjust the black (K) density setting.

Examine the black density bar (K). If the center oval matches the background pattern more than the other ovals, the black density does not need to be adjusted and you should continue with the next step. If not, use the following steps to adjust the density:

1 Press [ITEM] until BLACK DENSITY appears.

2 Press the right side of the [VALUE] key to increase the value, or press the left side to decrease it, until the number corresponding to the oval that most closely matches the background pattern appears.

3 Press [SELECT] to save the value. An asterisk (*) appears next to the selected setting.

Step 6: Reprint the color balance calibration page. (See step 1.)

Step 7: Adjust the gray balance.

Note Adjusting densities using the gray balance pattern allows you to fine-tune color balance. This process affects all four color bars.

Examine the gray balance circles in the box at the bottom of the color balance calibration page. If the circle in the center most closely matches the background pattern, then the gray balance does not need to be adjusted. If the circle does not match, use the following steps to adjust gray balance.

1 Locate the gray circle that most closely matches the background. The magenta (M) and yellow (Y) numbers associated with this circle indicate the optimum gray balance settings for these colors.

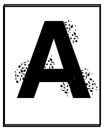
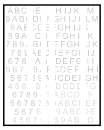
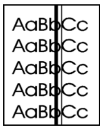
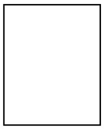
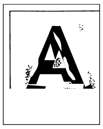
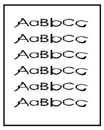
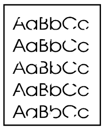
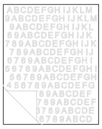
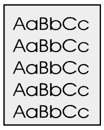
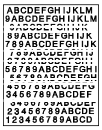
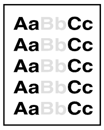
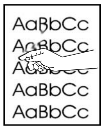
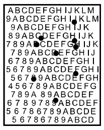
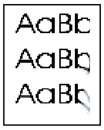
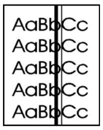
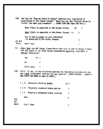
2 Adjust the magenta and yellow settings (yellow is horizontal and magenta is vertical) until the gray circle is in the middle. Use the values from the bars above to select the value to be entered.

3 After making adjustments to the magenta and yellow settings, press [GO] to return the printer to the READY state.

Image defects

Unless otherwise specified, all references in this section to horizontal or vertical directions of print quality problems refer to problems found on A-4 and Letter-sized media. For more information on a specific image defect, see the page numbers below each image in the following table.

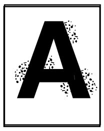
Table 7-7 Image defect table

 Background scatter2 (see page 254)	 Banding and horizontal lines2 (see page 254)	 Black lines (see page 255)	 Black or partially black pages (see page 255)
 Blank or white page(s) (see page 256)	No image available Blank spots	 Character voids (see page 257)	 Distorted image (see page 257)
 Dropouts (see page 257)	 Faded print, random faded areas (see page 258)	No image available Full page ghosting (see page 258)	 Gray background (see page 258)
 Irregular raised spots or stray toner 2 (see page 259)	 Light, dark, faded print (see page 259)	No image available Light black or no black print (see page 259)	 Loose toner (see page 260)
No image available		No image available	No image available
Mottled or marbled output (see page 260)	Random black spots (see page 260)	Sharkskin (see page 260)	Single color missing (see page 260)
No image available			
Sunburn (see page 260)	Toner smear (see page 261)	Vertical lines or streaks (see page 261)	Wavy characters (see page 262)

Additional defect information is found in the following sections:

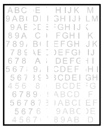
- Overhead transparency defects (see page 263)
- Repetitive defects (see page 265)

Background scatter



- The media does not meet HP specifications.
- The toner cartridge is defective.
- There is excess toner inside the printer. Clean the printer.
- The transfer roller is dirty or worn. Generate a cleaning page.

Banding and horizontal lines



Banding occurs when solid fill areas show streaks or bands of shade variations. This can be caused by:

- Worn, damaged, or contaminated gears.
- Consumables that are beyond their rated life.
- Improper consumable storage.

If the problem persists:

- Print a configuration page to check the life of the consumables. Replace any consumable that is past its rated life.
- Banding is more visible in some halftone patterns than others. Print a page using a halftone pattern such as “banddiag” provided in the Color Smart selection in the printer driver. If the defect occurs only once on a letter size sheet, try printing the pattern on a legal-size sheet.
- Observe the following from the test sample:
  - Check the spacing or “pitch” between the defects.
  - Check to see if the defect spans all color planes.
  - If the defect is in all color planes, does the defect produce a straight line through all color planes or does it move from one color plane to the next?
  - If the defect moves from one color plane to the next, measure the amount it moves. This movement amount is called the “procession.” Keep in mind the print order is K-M-C-Y. Measure the procession from K to M or M to C, not K to C.

CAUTION Do not expose the imaging drum to light for more than 15 seconds. The drum is light sensitive, and exposure to light can cause permanent damage.

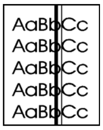
Banding — horizontal

- The imaging drum might have been exposed to light. (See Sunburn on page 260.)
- The ITB can accumulate contamination on its rollers causing a random mechanical banding. If you notice buildup on the rollers, replace the ITB.
- As the developer rotates, the gap between the imaging drum and the developer can vary slightly. This can cause toner to be transferred unevenly and appear lighter or darker approximately every 38 mm (1.5 inches). This defect is more apparent in secondary colors. There is no workaround for this defect.

Banding — vertical

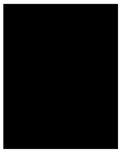
- The doctor blade on the developer can develop notches over time. If you observe severe notching, replace the developer.
- As the imaging drum gets older, the charge roller doesn't charge the imaging drum as well as it used to. If you notice buildup or contamination on the charge roller, replace the imaging drum.

Black lines



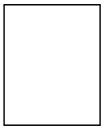
- The toner cartridge is defective.
- The toner cartridge is not seated properly.
- The fusing assembly is contaminated or damaged.
- The static eliminator teeth are contaminated or defective.
- The imaging drum is damaged or the waste toner collection in the drum is full. Replace the imaging drum.

Black or partially black pages



- Check for poor contact between the drum cartridge contact (for primary charging bias) and the primary charging bias contact. To improve the contact, clean the contacts. If the problem persists after cleaning or the contacts are deformed or damaged, replace them. If the contacts have slipped off, adjust them correctly.
- Check the drum cartridge (primary charging roller). If defective, replace the drum cartridge.
- Check for poor contacts in the connectors. Reconnect the DC controller PCB connector and the high-voltage PCB 2 connector correctly.
- Check for a defective high-voltage PCB (primary charging bias output shortage). If defective, replace the high-voltage PCB 2.
- Check for a defective DC controller PCB. If defective, replace the DC controller PCB.
- If ITB clutch was removed, check for proper timing.
- The black toner cartridge is empty.
- Make sure clutch CL2 is connected (plugged into the paper PCA).
- This defect can be caused by improper timing on the ITB clutch gears. Make sure that the cams are in sync. The two white gears on the left side of the printer (see Figure 6-47) should have two timing marks pointing toward each other.
  - Cams with a single line should be off one tooth clockwise on the right gear.
  - Cams with a double line should be aligned.

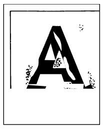
Blank or white pages



- Your software application is sending an extra page-eject command.
  - Check the software’s printing configuration information.
- There is a problem with the network configuration. Some sharing devices on networks might generate a blank page as a separator.
  - Check with the network administrator.
- The printer might be feeding two or more pages at once because the paper is difficult to separate.
- The sealing tape has been left in the toner cartridge.
- The toner cartridge is empty or defective.
- The laser scanner door does not open properly.
  - Remove and reseat the toner cartridge.
  - Check the laser scanner shutter door for proper operation.
- The toner cartridge guide is damaged, improperly positioned, or missing.
- There is no transfer roller voltage.
  - Perform the Half Self-Test Functional Check to check all other electrophotographic processes.
  - Replace the transfer roller if necessary.
- The high-voltage connectors are mounted on the high-voltage power supply (HVPS) PCA and protrude into the toner cartridge cavity.
  - Check the springs for functionality. Clean if dirty; replace if defective or missing.
  - The HVPS PCA is defective.
- The DC controller PCA is defective.
- There is no developing bias.
  - Clean the HVPS contacts. With no developing bias charge, toner is not attracted to the drum.
- There is no drum ground path.
  - Check the drum ground.
- The laser scanner cable assembly is defective.
- The page length and margins are not set correctly for the paper size. Verify that the ribbon connector at J1307 of the HVPS is properly seated.
- If the HVPS has been removed recently, verify that the ribbon connector from the DC controller PCA to the HVPS is properly seated at both ends.
- Verify that the photoconductive drum is rotating properly. Perform the drum diagnostic test to visually observe if the drum is rotating or using a felt-tipped marker place an index mark on the edge of the drum outside the image area. Turn on the printer (wait for drum rotation to occur), and then look to see if the drum has moved. If the drum has not moved, investigate the mechanical and electrical drum rotation circuitry and movement mechanisms.
- The imaging drum shutter might not be retracting. Replace the imaging drum.

Character voids

Use media that meets HP paper specifications.



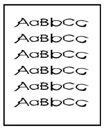
- The surface of the paper is too rough or too smooth for proper toner adhesion.
- The wrong side of the paper is being used for printing.
- The transparencies are not designed for proper toner adhesion.
- The transfer roller is defective.
- The laser scanner assembly is defective.

Colorless output (black only)

No
image
available

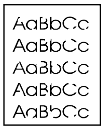
- Make sure clutch CL2 is connected (plugged into the paper PCA).
- This defect can be caused by improper timing on the ITB clutch gears. Make sure that the cams are in sync. The two white gears on the left side of the printer (see Figure 6-47) should have two timing marks pointing toward each other.
  - Cams with a single line should be off one tooth clockwise on the right gear.
  - Cams with a double line should be aligned.
- Check for a defective development PCB. If defective, replace the development PCB.
- Check for a defective DC controller PCB. If defective, replace the DC controller PCB.

Distorted image



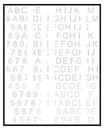
- The paper does not meet HP paper specifications or is stored improperly.
- The printer’s operating environment does not meet HP specifications.
- The connection of the cables to the laser scanner is poor.
- The connection of the cables to the ECU is poor.
- The laser scanner is defective.
- The DC controller is defective.

Dropouts



- The paper does not meet HP paper specifications.
- The printer’s operating environment does not meet specifications.
- The print density is set incorrectly. Change to a darker setting and retry printing.
- The DC controller PCA is defective.
- The high-voltage power supply PCA is defective.
- The transfer roller is defective.

Faded print, faded areas, or faded vertical streaks



- The message TRANSFER KIT LOW REPLACE TRANSFER KIT appears on the printer control panel. Print out a configuration page to verify the remaining life of the transfer belt. Replace the transfer belt if necessary.
- The moisture content of your media might be uneven or too low. Use media from a different source or from a new ream of paper.
- If some areas of the paper reject toner, try using paper from a different source or from a new ream of paper.
- The media might be too rough and exceed media specifications. See Supported media specifications on page 29. Do not use paper that exceeds specifications.
- Check that the printing environment is within humidity specifications.
- Faded print could result from low toner in a particular toner cartridge. If a TONER LOW or TONER OUT message appears on the printer control panel, replace the appropriate toner cartridge.
- Check to see if the transfer belt is contaminated. Use a lint-free cloth to clean any contaminants from the transfer belt surface.
- The connections into CL2 (ITB unit separation clutch) and CL3 (ITB cleaning roller separation clutch) have been switched at the clutches, not on the PCB. (This typically shows a light black print on the page.)
- The toner cartridge is getting low on toner.
- The toner density setting is not adjusted correctly.
- The internal mirror or optics are contaminated.
- The laser scanner is damaged.
- The document scanner needs to be recalibrated.
- There is a problem in the contact image sensor.
- There is a problem in the formatter.

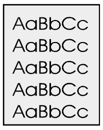
Full-page ghosting

Full-page ghosting occurs when an image prints in full color on one page, but a faded copy of it is also seen on the following page.

No image available

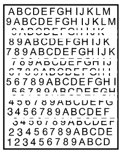
- Make sure that the top spring in the ITB drawer is properly connected.
- Replace the ITB.
- Ensure operation of the ITB Cleaning Roller Clutch (CL3).
- If the imaging drum is near end of life, replace it.
- If the toner cartridge is near end of life, replace it.

Gray streaks



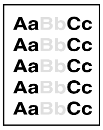
- The paper does not meet HP paper specifications or is stored improperly.
- The printer operating environment does not meet specifications.
- The toner density is set incorrectly.
- The toner cartridge is defective.
- There is excess toner inside the printer. Clean the printer.
- The printer is printing on envelope seams. Move the text to an area away from seams.
- The imaging drum is defective or at the end of its life. Replace the drum kit.

Irregular, raised spots or stray toner



- Toner collected on the transfer belt can cause smudging on the back of the page. Smudges commonly appear on the edges of pages after the media size is changed. The belt is self-cleaning and the smudging will normally clear within a few pages.
- Toner on the edge of the media is usually caused by toner collecting on the paper guides. Inspect the paper guides and clean with a lint-free cloth if necessary.
- Do not refeed paper that has already been through the printer. Re-feeding paper that has already passed through the printer can contaminate the fuser causing stray toner defects.
- Paper might print with blobs after warm-up. Print a few pages to resolve the anomaly.
- Verify that all media is cleared from the paper path.
- The fuser roller is damaged. Replace the fuser kit.
- If one toner color is streaking, that toner cartridge has been damaged. Replace the toner cartridge for the streaking color.
- The paper does not meet HP paper specifications. Use media that meets HP media specifications.

Light, dark, or faded print



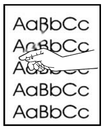
- The message TRANSFER KIT LOW REPLACE TRANSFER KIT appears on the printer control panel. Print out a configuration page to verify the remaining life of the transfer belt. Replace the transfer belt if necessary.
- The moisture content of your paper is uneven or too low. Use paper from a different source or from an unopened ream of paper.
- Some areas of the paper reject toner. Use paper from a different source or from an unopened ream of paper.
- The paper is excessively rough. Use a smoother, xerographic paper.
- The letterhead you are using is printed on rough paper. Try a smooth xerographic paper. If this solves your problem, consult with the printer of your letterhead to verify that the paper used meets the specifications for this printer.
- Media does not meet the specifications for this printer. Only use media that meets the media specifications for this printer.
- The printer is operating in excessively humid or dry conditions. Verify that the printing environment is within humidity specifications.
- If a TONER LOW or TONER OUT message is displayed on the printer control panel, replace the appropriate toner cartridge. If the problem persists, call for service.
- Excess toner may have been deposited on the transfer belt. Use a lint-free cloth to clean any excess toner from the transfer belt surface.
- The laser scanner is defective.
- The high-voltage power supply is defective.

Light black or no black print

No
image
available

- The black toner cartridge is empty. Replace it.
- The HVPS might be faulty.
- The connections into CL2 and CL3 have been switched at the clutches, not on the PCB.

Loose toner



- Loose toner is in the printer.
- The toner cartridge is defective.
- The paper is too smooth.
- The driver setting for the paper type is wrong.
- The fuser is defective.

Mottled or marbled output

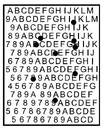
No image available

Print a configuration page, and refer to the color blocks at the bottom of the page. Replace the toner cartridge of the color or colors that are marbled.

Determine which toner color needs to be replaced by looking at the secondary colors on the self-test page.

- If red and green are mottled, replace yellow.
- If red and blue are mottled, replace magenta.
- If green and blue are mottled, replace cyan.

Random spots



- The paper does not meet HP paper specifications.
- You are printing on the wrong side of the paper.
- The printer requires cleaning with a cleaning page.
- The toner cartridge is damaged.
- The imaging drum is damaged.

Sharkskin (rough, mottled printing)

No image available

- Use paper with lower resistivity.
- Make sure the humidity and temperature are within specifications.
- Do not use Automatic Duplex mode. Duplex manually or not at all.

Single color missing

No image available

- Remove the toner cartridge and manually check the level of toner in the toner cartridge.
- Check for a defective light pipe sensor. If defective, replace the toner level sensor.

Sunburn

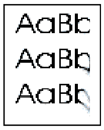
No image available

The imaging drum might have been exposed to light. Symptoms of sunburn are streaked or blurred lines across the length of the page (side-to-side on portrait, or top-to-bottom on landscape).

- Print 50 to 100 pages on the imaging drum to remove the sunburn.
- If sunburn symptoms are still occurring, allow the imaging drum to sit in a dark place for two to three days.
- If sunburn is severe (the symptoms don’t go away), replace the imaging drum.

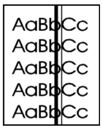
CAUTION Do not expose the imaging drum to light for more than 15 seconds. The drum is light sensitive, and exposure to light can cause permanent damage.

Toner smear



- There is dirt on the paper.
- The fusing rollers are dirty.
- The paper does not meet HP specifications.
- The toner cartridge is defective.
- The fusing assembly is defective.
- There is loose toner in the printer.
- The static eliminator is dirty or is not grounded, allowing a static charge to remain on a page.
- The DC controller PCA is defective.

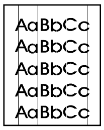
Vertical lines or streaks



- Check for a leak where light might be entering the printer.
- Check for circumferential scars on the photosensitive drum. If scars are present, replace the drum cartridge if the line goes through all colors.
- Check for circumferential scars on the upper fusing roller. If scars are present, replace the upper fusing roller if the line goes through all colors.
- Remove the imaging drum and inspect main charger or imaging drum for a contaminant, such as a fiber, if the line goes through all colors.

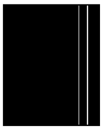
CAUTION Do not expose the imaging drum to light for more than 15 seconds. The drum is light sensitive, and exposure to light can cause permanent damage.

Vertical black lines



- The toner cartridge is defective.
- The toner cartridge is not seated properly.
- The fuser entrance is dirty.
- The fuser has scratches on it.
- This might be a repetitive defect. If so, the lines will repeat at a consistent interval down the page.
- The printer needs to be cleaned.
- There is a problem in the heating element.

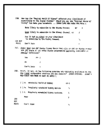
Vertical white lines



- If white lines or streaks appear only in the black areas of the printed media, print several configuration pages to clear the anomaly. If this does not clear the problem, check the sleeve surface to confirm the defect, then replace the black toner cartridge.
- If white lines appear only in a particular color, try printing several configuration pages to clear the error. If the error does not clear, check the sleeve surface to confirm the defect, then replace the defective toner cartridge.
- There is a lack of toner or the toner cartridge is faulty.
- There is dirt in the laser path.
- The fuser is defective.
- A mirror in the laser scanner is dirty.

Wavy characters

Mechanical instability in the scanner mechanism or the optics can cause wavy characters.



- Reprint the job to ensure that the problem persists.
- If the failure remains, replace the laser scanner assembly.

Overhead transparency defects

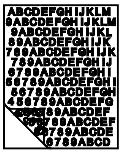
Overhead transparencies can display any of the image quality defects shown in the previous samples. In addition, because transparencies are pliable while in the print path, they are subject to being marked by the media-handling components.

Note Allow transparencies to cool at least 30 seconds before handling them.

- Make sure that “transparency” is checked as the media type in the Paper Tab in the printer driver. Also, make sure that the media input tray is correctly configured for transparencies. When Transparency is selected as the media type and ColorSmart II is selected on the Color tab, the printer will use a color treatment optimized for projection.
- If transparencies show lines and creases in the media and/or the printed output, compare the defect against the repetitive defect ruler (page 266) to help isolate the cause to a particular component.
- Check that the transparencies meet the specifications listed in the *HP LaserJet Family Print Media Guide.*
- If the transparencies have spots or smudges, reprint them being careful not to touch the surface of the media. Skin oils can contaminate transparencies, causing spots and smudges.
- Small, random dark areas on the trailing edge of solid fill pages might be caused by transparencies sticking together in the face up bin. Try printing the job in smaller batches.
- Send transparencies only to the face-down output bin.

Transparencies created on the printer might look blurry, but they can still be used successfully on reflective-type (portable) transparency projectors.

Dull or dark transparencies



- If the transparency colors are dull or dark, ensure that the transparencies meet the specifications for this printer (part number C2934A for Letter, and C2936A for A4).
- The selected colors are undesirable when printed. Select different colors in your software application or printer driver.
- Spots and smudges appear in the background areas of transparencies when they are projected. Oil from your hands can cause spots or smudges on transparencies. Reprint the transparencies, being careful not to touch the surface of the transparencies.
- You are using a reflective overhead projector. Use a standard overhead projector.

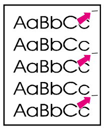
Incorrect image on transparencies

No image available

This might occur even though the correct media is loaded in the correct tray. Toner might not adhere to the media and an image might show up on pages where it isn’t meant to appear. (See Full-page ghosting on page 258.)

When this occurs on transparencies, the connections for the ITB cleaning roller (clutch 3) and for the secondary transfer roller (clutch 4) might be reversed.

Repetitive defects on transparencies



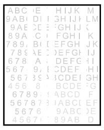
Overhead transparencies that have repetitive defects spaced 131 mm (5.2 in) apart indicate a defect on the upper fuser roller.

1 Turn the printer off and unplug the printer, allow 30 minutes for the fuser to cool, and then remove the fuser.

CAUTION Make sure to wait 30 minutes before removing the fuser. The fuser will be hot.

2 Turn the fuser gears and inspect the surface of the upper fusing roller. If the roller has surface defects (gouges), replace the fusing assembly.

Streaking on transparencies



If the transparencies have streaks, this could be the result of condensed wax from the toner making its way onto the fuser assembly rollers during the fusing process. Try cleaning the fuser rollers using the following process:

1. Saturate a corner of a lint-free, static-free wipe with isopropyl alcohol.
2. Open the alternate path door (the small door) at the back of the printer.
3. Place the printer into calibration mode by opening and then closing the large door at the rear of the printer, or by pulling a drawer open, and then quickly closing it.
4. While the printer is calibrating, the fuser rollers are rolling. Place the wipe up against each roller in turn, keeping it in place for five to 10 seconds.

Repetitive defects troubleshooting

Repetitive defects are defects that occur on the page. Most repetitive defects are caused by problems with one of the following:

Table 7-8.

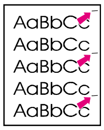
- Developer roller
- Charge roller
- Cleaning roller
- Transfer roller
- Fuser
- Imaging drum
- Transfer belt

See page 266 for the repetitive defect ruler and Table 7-9 for the defect spacing chart.

CAUTION Do not expose the imaging drum to light, and be careful not to scratch or get fingerprints on the drum surface during cleaning. Do not blow on the imaging drum.

Imaging drum defects

Causes:



- Damage such as scratches or dents on the imaging drum. These usually appear as black or white marks on the page.
- Paper dust adhering to the imaging drum. These usually appear as white marks in the dark printed areas of the page.
- Exposure of portions of the imaging drum to light. This causes light sections in the printed output. The life of the imaging drum is shortened by exposure to light.

Actions:

- Print at least four configuration pages to determine if the defect repeats in the same horizontal orientation.
- Inspect the imaging drum for scratches, dents, or other damage. Replace if needed.
- If the problem is dust, remove the dust with isopropyl alcohol applied with a lint-free, static-free wipe. Try this *only* if the print defect is unacceptable and the only other alternative is replacing the imaging drum.
- Defects caused by exposure to light might clear up over time. If severe, replace the imaging drum.

Repetitive defect ruler

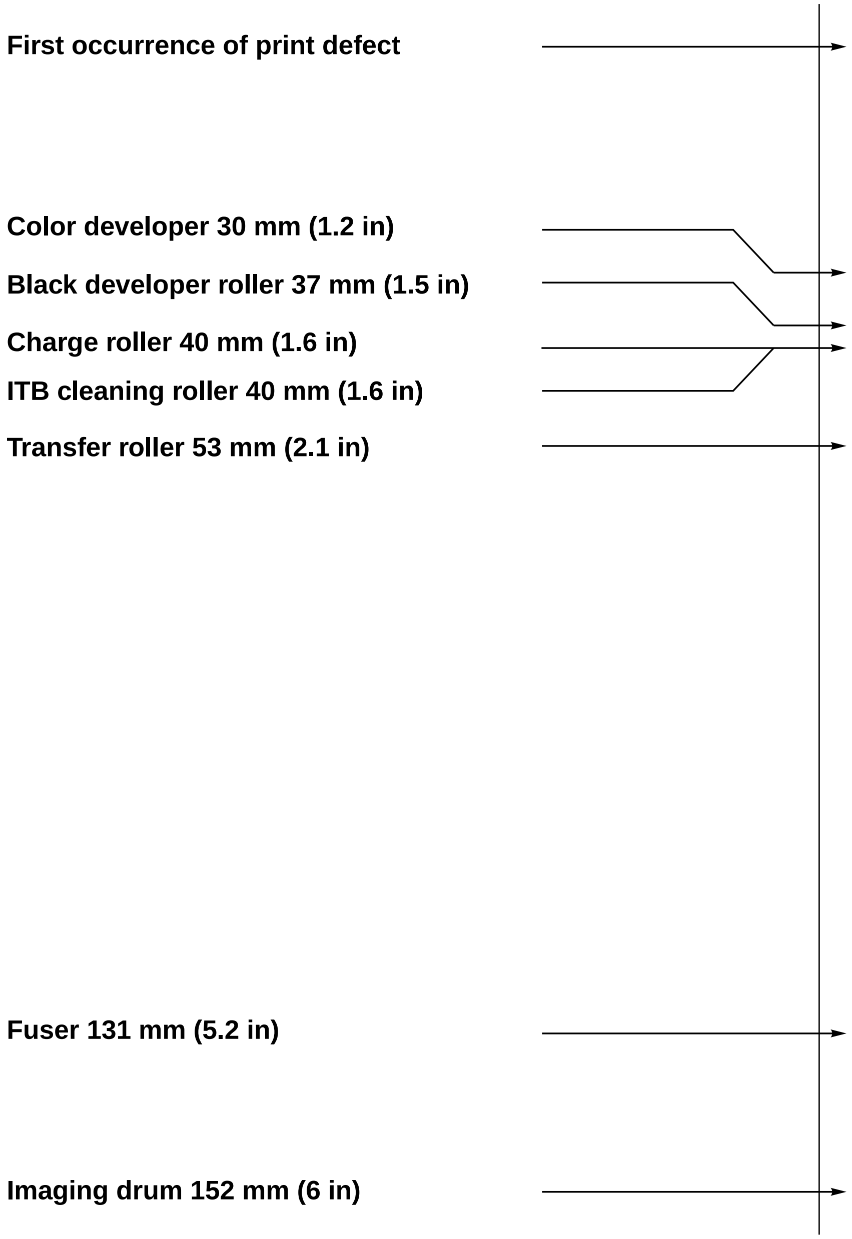

First occurrence of print defect
Color developer 30 mm (1.2 in)
Black developer roller 37 mm (1.5 in)
Charge roller 40 mm (1.6 in)
ITB cleaning roller 40 mm (1.6 in)
Transfer roller 53 mm (2.1 in)
Fuser 131 mm (5.2 in)
Imaging drum 152 mm (6 in)

Figure 7-8 Repetitive defect ruler

Table 7-9 Defect spacing chart

Consumable	Roller	Distance
Drum	Charge roller	40 mm (1.6 in)
	Imaging drum	152 mm (6 in)
Developer	Black developer	37 mm (1.5 in)
	Color developer	30 mm (1.2 in)
Fuser		131 mm (5.2 in)
ITB	ICL roller	40 mm (1.6 in)
Transfer roller		53 mm (2.1 in)

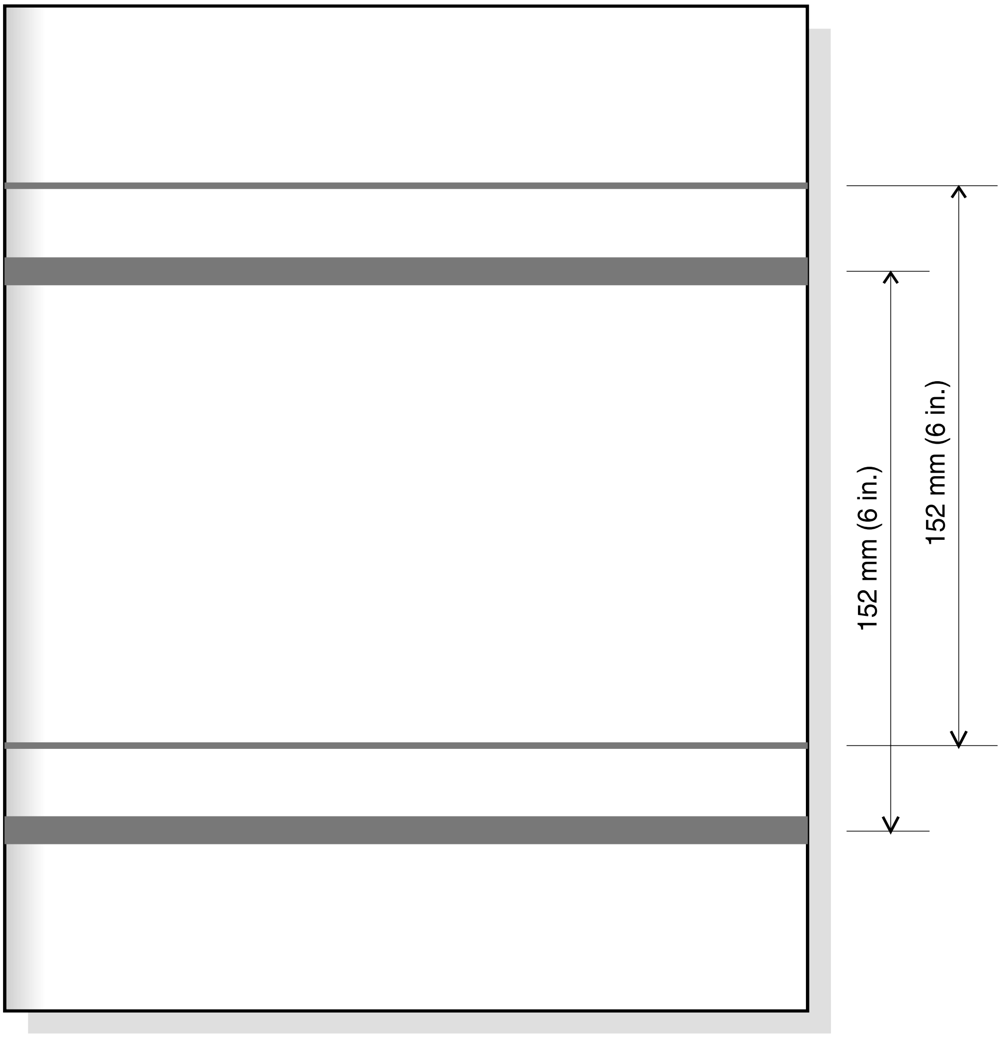


Figure 7-9 Imaging drum exposed to light (proportions not to scale)

Interface troubleshooting

Communications checks

Note Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems might not be covered by the product's Hewlett-Packard warranty.

Refer the customer to the network administrator for assistance in troubleshooting network problems.

If the printer is not connected to an MS-DOS-based host, proceed to Table 7-10, Communications check.

Table 7-10 Communications check

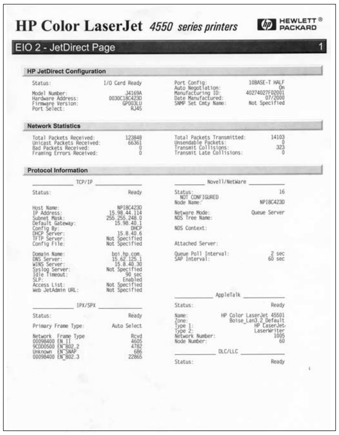
Check	Action
Is your computer configured to the parameters described in the configuration instructions?	These parameters are required to communicate with the printer. Verify that the configuration of the computer's communications port matches these parameters. **Note:** If these parameters are not set properly, an error might display on the control panel.

EIO troubleshooting

If the printer contains an optional HP JetDirect print server, and you cannot communicate with the printer over the network, verify the operation of the print server. Print an HP JetDirect configuration page. If the message "I/O CARD READY" does not appear on the configuration page, see the troubleshooting section of the *HP JetDirect Print Server Software Installation Guide*.

If the host system and printer still are not communicating, replace the formatter PCB and the EIO card and reconfigure the printer. If the problem persists, a protocol analyzer might be needed to find the source of the problem.

CAUTION HP LaserJet printers are not designed to work with mechanical switch-box products without proper surge protection. These devices generate high transient voltages that cause permanent damage to the formatter PCB. This circumstance is not covered by the Hewlett-Packard warranty.



HP Color LaserJet 4550 series printers

EIO 2 - JetDirect Page 1

HP JetDirect Configuration

```
Status:              I/O Card Ready        Port Config:          10BASE-T HALF
                                           Auto Negotiation:                On
Model Number:                J4169A        Manufacturing ID:    40274027F02001
Hardware Address:      0030C18C4230        Date Manufactured:          07/2000
Firmware Version:           GP003LU        SNMP Set Cmty Name:   Not Specified
Port Select:                   RJ45
```

Network Statistics

```
Total Packets Received:      123848        Total Packets Transmitted:    14103
Unicast Packets Received:     66361        Unsendable Packets:               0
Bad Packets Received:             0        Transmit Collisions:            323
Framing Errors Received:          0        Transmit Late Collisions:         0
```

Protocol Information

```
_________ TCP/IP __________                ________ Novell/NetWare ________

Status:                       Ready        Status:                          16
                                             NOT CONFIGURED
Host Name:                 NPI8C4230       Node Name:                NPI8C4230
IP Address:             15.98.44.114
Subnet Mask:           255.255.248.0       Netware Mode:          Queue Server
Default Gateway:          15.98.40.1       NDS Tree Name:
Config By:                      DHCP
DHCP Server:              15.8.40.6        NDS Context:
TFTP Server:           Not Specified
Config File:           Not Specified       Attached Server:

Domain Name:             boi.hp.com.       Queue Poll Interval:          2 sec
DNS Server:              15.62.125.1       SAP Interval:                60 sec
WINS Server:              15.8.40.30
Syslog Server:         Not Specified
Idle Timeout:                 90 sec
SLP:                         Enabled
Access List:           Not Specified
Web JetAdmin URL:      Not Specified
                                           ___________ AppleTalk ___________
_________ IPX/SPX _________                Status:                       Ready

Status:                        Ready       Name:        HP Color LaserJet 45501
                                           Zone:        Boise_Lan3.2_Default
Primary Frame Type:      Auto Select       Type 1:                 HP LaserJet
                                           Type 2:                 LaserWriter
Network  Frame Type             Rcvd       Network Number:                1005
00098400 EN_II                  4605       Node Number:                     60
9CDD0500 EN_802.2               4782
Unknown  EN_SNAP                 686       ____________ DLC/LLC ____________
00098400 EN_802.3              22865
                                           Status:                       Ready
```

Figure 7-10 HP EIO configuration page

AUTOEXEC.BAT standard configurations

Parallel DOS commands

Ensure that the AUTOEXEC.BAT file contains the following statements for parallel interface communications:

```
MODE LPT1: ,,P
```

For MS-DOS version 4.0 and above:

```
MODE LPT1: ,,B
```

Note This example assumes that you are using parallel printer port LPT1. If you are using LPT2 or LPT3, replace LPT1 in the example with the appropriate printer port.

Printer Job Language (PJL) commands

See the *HP Printer Job Language Technical Reference Manual* for a complete description of PJL commands. This manual is available with the *HP PCL/PJL Reference Set* on CD-ROM, part number 5021-0337.

@PJL [Enter]

This command enables the specified printer language. If the printer does not receive this command it enables the default language. This ensures the correct operation applications that do not support PJL. The command syntax is:

```
@PJL [Enter] LANGUAGE = {PCL/PostScript} [<CR>] <LF>
```

UEL (universal exit language)

This command (also referred to as the universal exit language command) terminates the current printer language and returns control to PJL. It performs the following actions:

- Prints all data received before this command.
- Performs a reset: `<esc>E in PCL, <cntrl>D in PostScript`.
- Turns control over to PJL.

This command is also a valid HP-GL/2 terminator.

The UEL command must be immediately followed by the "@PJL" command prefix. Characters or control codes other than @PJL (such as `<CR>` or `<LF>`), enable the default language and process the print job in that language. All jobs must begin and end with the UEL command. Besides entering PJL, the UEL command has the same effect as the `<esc>E` command. However, the `<esc>E` command should always be included to ensure backward compatibility.

@PJL COMMENT

This command designates the current line as a comment, which is ignored. The syntax is:

```
@PJL COMMENT <words> [<CR>] <LF>
```

@PJL INFO CONFIG

This command solicits a response to describe the installed options and allows the printer to automatically configure the installed options as the applications require.

@PJL INFO ID

This command identifies the printer type to the host for reference when selecting printer drivers for automatic installation. The command syntax is:

```
@PJL INFO ID <CR> <LF>
```

@PJL INFO USTATUS

This command queries the state of unsolicited JOB status. PAGE and TIMED status are not supported. The syntax is:

```
@PJL INFO USTATUS <CR> <LF>
```

@PJL INFO PAGECOUNT

This command returns the number of pages printed by the engine.

@PJL JOB

This command informs the printer of the start of a PJL job and synchronizes the job status information. The printer counts print jobs, including nested jobs, incrementing the job counter for the @PJL JOB command and decrementing it for @PJL EOJ.

The printer accepts the NAME= parameter and returns the name string in the unsolicited JOB start status message (if unsolicited job status is enabled). The printer transmits the unsolicited JOB status message to every I/O channel that has enabled this function. This message's format is:

```
@PJL USTATUS JOB <CR><LF>
START<CR><LF>
[NAME=<job name><CR><LF>]
<FF>
```

The printer resets the nested job counter whenever it switches the source to a different I/O channel. This prevents a corrupt job on one channel from disrupting the activities on another channel.

@PJL EOJ

This command identifies the end of a print job and is a hint for the I/O switching algorithm. The printer counts nested jobs and recognizes job boundaries when the counter decrements to zero. The printer ignores isolated EOJ commands. Each EOJ must be preceded by a JOB command.

@PJL ECHO

This printer supports the ECHO command which transmits its parameters over the I/O channel to the host that issued the command.

@PJL USTATUS JOB=ON/OFF

This command enables or disables the JOB status for the I/O channel that delivers the command.

@PJL USTATUSOFF

This command disables the unsolicited JOB status for the I/O channel that delivered the command. For this printer, it duplicates the function of `@PJL USTATUS JOB=OFF, AND @PJL USTATUS DEVICE=OFF`.

Note All commands not supported by this printer's PJL command set are returned with the message `@PJL XXXX<CR><LF>?<CR><LF>`.

Control panel troubleshooting

Control panel access

Accessing the diagnostics for the control panel is a simple process. Hold down the left side of the [ITEM] key (<--) and turn on the printer. Hold the key down until DIAGNOSTICS MODE appears on the front panel, and then release the key. The front panel will change and display FORMATTER DIAGS EXECUTE TESTS. Press the [MENU] key to switch between the formatter diagnostics and the engine diagnostics. Press [ITEM] to scroll through the diagnostics available in each section.

A menu map helps you use the control panel menus. See the menu map sample that follows.

Printing a menu map

Printing a menu map can help you navigate through control panel menus.

Printing a menu map

1 On the printer’s control panel, press [MENU] until INFORMATION MENU appears.

2 Press [ITEM] until PRINT MENU MAP appears.

3 Press [SELECT] to print the menu map. The printer will return to the READY state.

Interpreting the menu map

The following sample illustrates the printer’s menu map.

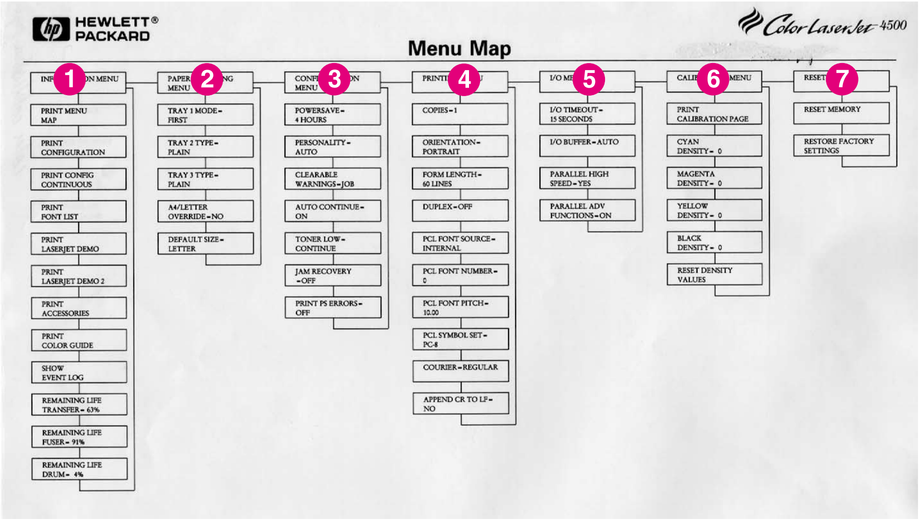

HEWLETT® PACKARD
Color LaserJet 4500
Menu Map
1
INF ON MENU
PRINT MENU MAP
PRINT CONFIGURATION
PRINT CONFIG CONTINUOUS
PRINT FONT LIST
PRINT LASERJET DEMO
PRINT LASERJET DEMO 2
PRINT ACCESSORIES
PRINT COLOR GUIDE
SHOW EVENT LOG
REMAINING LIFE TRANSFER= 63%
REMAINING LIFE FUSER= 91%
REMAINING LIFE DRUM= 4%
2
PAPER NG MENU
TRAY 1 MODE= FIRST
TRAY 2 TYPE= PLAIN
TRAY 3 TYPE= PLAIN
A4/LETTER OVERRIDE=NO
DEFAULT SIZE= LETTER
3
CONFI ON MENU
POWERSAVE= 4 HOURS
PERSONALITY= AUTO
CLEARABLE WARNINGS=JOB
AUTO CONTINUE= ON
TONER LOW= CONTINUE
JAM RECOVERY =OFF
PRINT PS ERRORS= OFF
4
PRINTI U
COPIES=1
ORIENTATION= PORTRAIT
FORM LENGTH= 60 LINES
DUPLEX=OFF
PCL FONT SOURCE= INTERNAL
PCL FONT NUMBER= 0
PCL FONT PITCH= 10.00
PCL SYMBOL SET= PC-8
COURIER=REGULAR
APPEND CR TO LF= NO
5
I/O M
I/O TIMEOUT= 15 SECONDS
I/O BUFFER=AUTO
PARALLEL HIGH SPEED=YES
PARALLEL ADV FUNCTIONS=ON
6
CALI MENU
PRINT CALIBRATION PAGE
CYAN DENSITY= 0
MAGENTA DENSITY= 0
YELLOW DENSITY= 0
BLACK DENSITY= 0
RESET DENSITY VALUES
7
RESET
RESET MEMORY
RESTORE FACTORY SETTINGS

Figure 7-11 **4500 series menu map**

1 Information Menu

2 Paper Handling Menu

3 Configuration Menu

4 Printing Menu

5 I/O Menu

6 Calibration Menu

7 Resets Menu

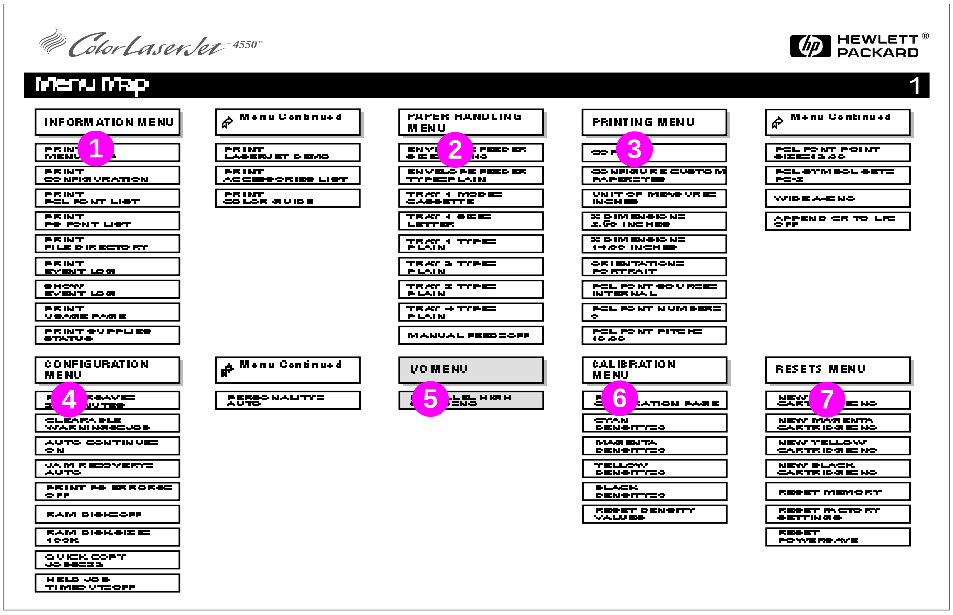

ColorLaserJet 4550
HEWLETT PACKARD
Menu Map
1
INFORMATION MENU
Menu Continued
PAPER HANDLING MENU
PRINTING MENU
Menu Continued
CONFIGURATION MENU
Menu Continued
I/O MENU
CALIBRATION MENU
RESETS MENU
1
2
3
4
5
6
7

Figure 7-12 **4550 series menu map**

1. Information menu
2. Paper handling menu
3. Printing menu
4. Configuration menu
5. I/O menu
6. Calibration menu
7. Resets menu
8. Quick Copy Jobs menu (only shown if a hard disk is installed)
9. Private/Stored Jobs menu (only shown if a hard disk is installed)

Note Some menus only appear when the hard disk is installed.

Information Menu

The Information Menu selections are used for changing and printing specific printer information.

Table 7-11 HP Color LaserJet 4500 Information Menu

Menu item	Description
PRINT MENU MAP	Prints the control panel menu map.
PRINT CONFIGURATION	Prints the printer configuration page.
PRINT CONFIG CONTINUOUS	Continuously prints the configuration page until [Cancel Job] is pressed.
PRINT FONT LIST	Prints the available PCL and PS (emulated PostScript) font samples.
PRINT LASERJET DEMO	Prints a demonstration page containing five images (A4/LTR).
PRINT LASERJET DEMO 2	Prints a duplexed (simplex if no duplexer present) demo page on the size shown in default size. (48 MB required for simplex, 64 MB for duplex).
PRINT ACCESSORIES	Prints a page giving the accessory and supplies part numbers (in English, French, German, and Spanish).
PRINT COLOR GUIDE	Prints a how to use color guide (A4/LTR).
SHOW EVENT LOG	Prints a historical list of printer events.
REMAINING LIFE	Displays the projected remaining life for the transfer belt, fuser, and imaging drum.

Table 7-12 HP Color LaserJet 4550 Information Menu

Menu item	Description
PRINT MENU MAP	Prints the control panel menu map.
PRINT CONFIGURATION	Prints the printer configuration page.
PRINT FONT LIST	Prints the available PCL and PS (emulated PostScript) font samples.
PRINT FILE DIRECTORY	Prints the name and directory of files stored in the printer on an optional hard disk or RAM memory module.
PRINT EVENT LOG	Prints a historical list of printer events.
SHOW EVENT LOG	Displays a historical list of printer events on the control panel.
PRINT PAPER PATH TEST	Prints a test of the paper path for the printer to make sure there are no media jams.
PRINT USAGE PAGE	Prints a count of all media sizes that have passed through the printer. Also lists whether they were simplex, duplex, monochrome, or color.
PRINT SUPPLIES STATUS PAGE	Prints the estimated remaining life for the toner cartridges, transfer belt, fuser, and imaging drum.
PRINT LASERJET DEMO	Prints a demonstration page for the printer.
ACCESSORIES LIST	Prints a list of optional accessories that have been installed on the printer.
COLOR GUIDE	Prints a one-page guide with hints on using color effectively.

Paper Handling Menu

The Paper Handling Menu allows you to configure input trays by size and type. This menu can also be used to set the default media size and type.

Note

The default mode for Tray 1 is `TRAY 1 MODE=FIRST`. In this mode, if media is loaded in Tray 1 and no other tray is requested, the printer will pull media from Tray 1 regardless of the size and type of media loaded in the tray. To configure Tray 1 by size or type, it must be configured as `TRAY 1 MODE=CASSETTE`.

Table 7-13 HP Color LaserJet 4500 Paper Handling Menu

Menu item	Values
TRAY 1 MODE	FIRST* CASSETTE
TRAY 1 SIZE (appears only if Tray 1 mode is set to TRAY 1 MODE=CASSETTE)	LETTER*/A4** LEGAL EXEC JIS B5 A5 CUSTOM B5 COM10 C5 DL MONARC
TRAY 1 TYPE (appears only if Tray 1 mode is set to TRAY 1 MODE=CASSETTE)	PLAIN* PREPRINTD LTRHEAD TRNSPRNCY GLOSS PREPUNCHD LABELS BOND RECYCLED COLOR HEAVY CARDSTOCK
TRAY 2 TYPE	(same choices as TRAY 1 TYPE except LABELS and CARDSTOCK)
TRAY 3 TYPE	(same choices as TRAY 1 TYPE except LABELS and CARDSTOCK)
A4/LETTER OVERRIDE	NO* YES
DEFAULT SIZE	(same choices as TRAY 1 SIZE)

*Denotes default setting
**A-4 is the default for printers sold in Asia

Table 7-14 HP Color LaserJet 4550 Paper Handling Menu

Menu item	Values
TRAY 1 MODE	FIRST* CASSETTE
TRAY 1 SIZE (appears only if Tray 1 mode is set to TRAY 1 MODE=CASSETTE)	LETTER*/A4** LEGAL EXEC JIS B5 A5 CUSTOM B5 COM10 C5 DL MONARC
TRAY 1 TYPE (appears only if Tray 1 mode is set to TRAY 1 MODE=CASSETTE)	PLAIN* PREPRINTD LTRHEAD TRNSPRNCY GLOSS PREPUNCHD LABELS BOND RECYCLED COLOR HEAVY CARDSTOCK
TRAY 2 TYPE	(same choices as TRAY 1 TYPE except LABELS and CARDSTOCK)
TRAY 3 TYPE	(same choices as TRAY 1 TYPE except LABELS and CARDSTOCK)
MANUAL FEED	ON OFF

Configuration Menu

The Configuration Menu is used to set general printer default settings.

CAUTION Hewlett-Packard recommends that configuration settings only be changed by a system administrator. Configuration settings seldom need to be changed.

Table 7-15 HP Color LaserJet 4500 Configuration settings

Menu item	Values	Description
POWERSAVE	OFF 1 MIN (used for troubleshooting) 30 MIN 1 HR* 2 HRS 4 HRS 8 HRS	The length of time before the printer goes into power-saving mode.
PERSONALITY	AUTO* PCL PS	The personality (language) the printer uses to process a print job.
CLEARABLE WARNINGS	JOB* ON	If ON, message appears until [Go] is pressed. If JOB, message appears until end of print job.
AUTO CONTINUE	ON* OFF	Determines whether the printer continues printing when certain errors occur. If ON, printer returns to the READY state. If OFF, printer remains offline until [Go] is pressed.
TONER LOW	CONTINUE* STOP	Determines whether the printer continues or stops printing when a TONER LOW condition is detected.
JAM RECOVERY	OFF* ON	Printer attempts to recover from jams and reprints affected pages.
PRINT PS ERRORS	OFF* ON	Prints out an error page when emulated PostScript errors occur.

*Denotes default setting

Table 7-16 HP Color LaserJet 4550 Configuration settings

Menu item	Values	Description
POWERSAVE	OFF 1 MIN (used for troubleshooting) 15 MIN 30 MIN* 1 HR* 2 HRS 4 HRS	The length of time before the printer goes into power-saving mode.
CLEARABLE WARNINGS	JOB* ON	If ON, message appears until [Go] is pressed. If JOB, message appears until end of print job.
AUTO CONTINUE	ON* OFF	Determines whether the printer continues printing when certain errors occur. If ON, printer returns to the READY state. If OFF, printer remains offline until [Go] is pressed.
JAM RECOVERY	OFF* ON	Printer attempts to recover from jams and reprints affected pages.
PRINT PS ERRORS	OFF* ON	Prints out an error page when emulated PostScript errors occur.
RAM DISK	OFF* ON	Determines if a RAM disk is installed and whether or not it is activated.
RAM DISK SIZE=		Displays the size (in MG or GB) of the activated RAM disk (if installed).
QUICK COPY JOBS=		Displays the number of Quick copy jobs saved in printer memory.
HELD JOB TIMEOUT	OFF* ON	Sets the length of time the printer will save a held job in memory prior to deleting it.
PERSONALITY	AUTO* PCL PS	The personality (language) the printer uses to process a print job.

*Denotes default setting

Printing Menu

The Printing Menu is used to set default settings for a specific print job.

Table 7-17 HP Color LaserJet 4500 Printing Menu settings

Menu Item	Values	Description
COPIES	1 to 999 (default:1)	Number of copies.
ORIENTATION	PORTRAIT* LANDSCAPE	Determines the default page orientation.
FORM LENGTH	5 to 128 lines (default: 60)	Maximum lines on a page before a formfeed occurs.
DUPLEX[1]	OFF* ON	Enables two-sided printing.
BINDING[2]	LONG EDGE* SHORT EDGE	Prints pages for specified binding type.
PCL FONT SOURCE	INTERNAL* SOFT SLOT n (n = 1,2,3)	Instructs the printer where to look for PCL fonts.
PCL FONT NUMBER	0 to 999 (default: 0)	Specifies a default PCL font number.
PCL FONT PITCH[3]	0.44 to 99.99 (default: 10)	Specifies a default pitch for PCL fonts.
PCL FONT POINT SIZE[4]	4 to 999.75 (default: 12)	Specifies a default font size for PCL fonts.
PCL SYMBOL SET	PC-8 (default)	Used to select an appropriate symbol set.
COURIER	REGULAR* DARK	Note: Dark Courier was used in older LaserJet printers.
APPEND CR TO LF	NO* YES	Appends a carriage return to each line feed character in the data stream. (UNIX)

*Denotes default setting

[1] Only appears when the duplex unit is attached

[2] Only appears when `DUPLEX` is selected

[3] Only appears when a fixed space font is specified

[4] Only appears when a proportional space font is specified

Table 7-18 HP Color LaserJet 4550 Printing Menu settings

Menu Item	Values	Description
COPIES	1 to 999 (default:1)	Number of copies.
UNIT OF MEASURE	INCHES MM	Set the unit of measurement.
X DIMENSION		Determine the length of the custom size media.
Y DIMENSION		Determine the width of the custom size media.
ORIENTATION	PORTRAIT* LANDSCAPE	Determines the default page orientation.
PCL FONT SOURCE	INTERNAL* SOFT SLOT n (n = 1,2,3)	Instructs the printer where to look for PCL fonts.
PCL FONT NUMBER	0 to 999 (default: 0)	Specifies a default PCL font number.
PCL FONT PITCH[1]	0.44 to 99.99 (default: 10)	Specifies a default pitch for PCL fonts.
PCL FONT POINT SIZE[2]	4 to 999.75 (default: 12)	Specifies a default font size for PCL fonts.
PCL SYMBOL SET	PC-8 (default)	Used to select an appropriate symbol set.
WIDE A4	NO* YES	Sets the printer to allow side-A4 type media.
APPEND CR TO LF	NO* YES	Appends a carriage return to each line feed character in the data stream. (UNIX)

*Denotes default setting

[1] Only appears when a fixed space font is specified

[2] Only appears when a proportional space font is specified

I/O Menu

The I/O Menu allows you to make changes to printer interface settings. The following table lists the selections that appear for each item in this menu.

Table 7-19 HP Color LaserJet 4500 I/O Menu settings

Menu Item	Values	Description
I/O TIMEOUT	5 to 300 SECONDS (default: 15)	Amount of time the printer waits to receive data before switching to another port.
I/O BUFFER	AUTO* OFF ON	Allocates memory to I/O ports.
I/O BUFFER SIZE[1]	nnnnnnK (default: 100K)	Amount of memory allocated to the I/O ports.
PARALLEL HIGH SPEED	YES* NO	Allows faster parallel communications supported by newer computers.
PARALLEL ADV FUNCTIONS	ON* OFF	Turns bidirectional parallel communication on and off.

*Denotes default setting
[1] Only appears if I/O BUFFER is ON

Table 7-20 HP Color LaserJet 4550 I/O Menu settings

Menu Item	Values	Description
PARALLEL HIGH SPEED	YES* NO	Allows faster parallel communications supported by newer computers

EIO Menu

If an Enhanced Input Output (EIO) card (for example, an HP JetDirect Print Server) has been installed in the printer, an additional menu is available. This additional menu provides a way to configure the EIO accessory and to adjust network interface settings. For information about HP JetDirect EIO menus, see the *HP JetDirect Print Server Software Installation Guide*. This guide is included with the HP Color LaserJet 4500N and 4500DN printers and the 4550N, 4550DN and 4550HDN printers, and is also available through HP Direct. (See Appendix D in the online user guide for ordering information.)

Calibration Menu

This printer features automatic, internal calibration to produce optimum color for most print jobs. The Calibration Menu provides fine-tuning for critical color-matching requirements.

For information about using this menu to set toner densities, see page 250.

CAUTION Calibrating toner densities changes the color balance of your printer by altering halftones. It affects all print jobs. Notify your network administrator before performing this procedure.

Table 7-21 HP Color LaserJet 4500 Calibration Menu settings

Menu Item	Values	Description
PRINT CALIBRATION PAGE		Prints out the color calibration page.
CYAN DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing cyan toner density.
MAGENTA DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing magenta toner density.
YELLOW DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing yellow toner density.
BLACK DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing black toner density.
RESET DENSITY VALUES		Resets density values back to default settings. Press [Select] to reset values.

Table 7-22 HP Color LaserJet 4550 Calibration Menu settings

Menu Item	Values	Description
PRINT CALIBRATION PAGE		Prints out the color calibration page.
CYAN DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing cyan toner density.
MAGENTA DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing magenta toner density.
YELLOW DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing yellow toner density.
BLACK DENSITY	-5 to +5 (default: 0)	Used for increasing or decreasing black toner density.
RESET DENSITY VALUES		Resets density values back to default settings. Press [Select] to reset values.

Resets Menu

The Resets Menu is used for resetting the printer's memory and for returning the printer to its factory default settings. It is also used to clear maintenance messages following the replacement of certain consumable items.

Table 7-23 HP Color LaserJet 4500 Resets Menu settings

Menu Item	Description
RESET MEMORY	Resets the printer to user-specified default settings.
RESTORE FACTORY DEFAULTS	Resets the printer to factory default settings.
NEW TRANSFER KIT SELECT IF DONE	Clears the maintenance message after the transfer kit has been replaced.
NEW FUSER KIT SELECT IF DONE	Clears the maintenance message after the fuser kit has been replaced.

Table 7-24 HP Color LaserJet 4550 Resets Menu settings

Menu Item	Description
NEW [COLOR] CARTRIDGE	Resets the toner gauge for the printer and allows printing to continue.
NEW TRANSFER KIT SELECT IF DONE	Clears the maintenance message after the transfer kit has been replaced.
NEW FUSER KIT SELECT IF DONE	Clears the maintenance message after the fuser kit has been replaced.
RESET MEMORY	Resets the printer to user-specified default settings.
RESTORE FACTORY SETTINGS	Resets the printer and control panel menus to factory default settings.
POWERSAVE	Allows PowerSave feature to be turned on or off.

Hard disk dependent menus

Quick Copy Jobs menu

This menu provides a list of the quick copy jobs stored on the printer hard disk. The user can print or delete these jobs from the control panel.

Note If there are no quick copy jobs stored on the printer's hard disk, this menu is not displayed on the control panel.

Table 7-25 HP Color LaserJet 4550 Quick Copy Jobs menu

Menu Item	Values	Description
[JOBNAME]		The name of the quick copy job defined by the sender.
COPIES=1	1 to 999 DELETE	The number of additional copies the user wants to print.

Private/Stored Jobs menu

This menu provides a list of the private and stored jobs on the printer’s hard disk. The user can print or delete these jobs from the control panel.

Note If there are no private or stored jobs on the printer’s hard disk, this menu is not displayed on the control panel.

Table 7-26 HP Color LaserJet 4550 Private/Stored Jobs menu

Menu Item	Values	Description
[JOBNAME]		The name of the job defined by the sender stored on the printer’s hard disk.
PIN: 0000		To print the job, the user must enter the Personal Identification Number (PIN) that was assigned to the job in the driver.
COPIES=1	1 to 999 DELETE	The number of copies the user wants to print. 1-999: Prints the requested number of copies of the job. DELETE: Deletes the job from the printer’s hard disk.

Troubleshooting tools

Embedded Web server

The embedded Web server allows you to view printer and network status and to manage printing functions from your PC instead of from the printer control panel. This service is designed for offices using an IP network and a standard Web browser. Below are examples of what you can do using the embedded Web server:

- view printer control panel messages
- determine the remaining life on all consumables
- order consumables
- view and change tray configurations
- view and change the printer control panel menu configuration
- view and print internal pages
- receive notification of printer events
- view and change network configuration

To use the embedded Web server, you must have an IP-based network and a Web browser. The embedded Web server can be used with Microsoft Internet Explorer 4 or above, and with Netscape Navigator 4 and above. IPX-based printer connections are not supported by the embedded Web server.

To use the embedded Web server

1. Open your Web browser.
2. Type the IP address assigned to the printer into the Address or Location field.

The IP address for the printer is listed on the printer configuration page. For more information about printing a Configuration Page, see Printer configuration page (page 287).

Embedded Web server page sets

The embedded Web server has three sets of internal Web pages for collecting information about the printer and for changing configuration options. These sets are:

- Home pages
- Device pages
- Networking pages

When the embedded Web server is active, each set of pages is listed on the browser screen. Click on the set that you want to view, and the selection expands to display a list of frequently accessed Web links.

Note Each page in the embedded Web server connects to online Help. For more information regarding a particular page, click the Help button.

Home page set

The home pages of the embedded Web server are the informational pages for the printer. These include:

- **Printer Status page**
  This page displays printer capabilities, control panel messages, and status lights that currently appear on the printer control panel. From here, you can set the frequency at which the embedded Web server will check the printer status. This page also displays consumable life levels and the input tray configurations.
- **Configuration page**
  This page displays the printer configuration page. For more information about interpreting and printing the configuration page, see page 287.
- **Supplies status page**
  This page displays the levels of the consumables for the printer. For more information about interpreting and printing the supplies status page, see page 290.
- **Usage page**
  This page displays the amount of each media type that has been used by the printer. For more information about interpreting and printing the usage page, see page 291.
- **Event Log page**
  This page displays the printer’s event log. For more information about interpreting and printing the event log, see page 292.
- **Device Identification page**
  This page displays the name, asset number, network address, model number, and serial number for this printer. To set the name and asset number, see the description of the Device Identification page below.
- **Device page set**
  The device pages of the embedded Web server allow you to configure the printer from your PC. The device pages can be password protected. Always consult with your network administrator before changing the printer’s configuration.
- **Configure Printer page**
  Configure all printer settings from this page.
- **Alerts page**
  Input a list of recipients for electronic notification of various printer events.
- **E-Mail page**
  Configure the incoming and outgoing mail servers.
- **Security page**
  Set a password for the embedded Web server. Passwords and features configuration should only be determined by the network administrator. If a password is set, users will require a password for entry into the device sections of the embedded Web server.
- **Other Links page**
  Add or customize links to other websites. These links are displayed on the navigational bar throughout the embedded Web server pages.

  There are two permanent links, “Ask a question” where the user can get help with the printer, and “Order Supplies” where you can order printer supplies. Order Supplies is only available from the Device page set.
- **Language page**
  Determine the language in which to display the embedded Web server information.
- **Device Identification page**
  Name the printer and assign an asset number to it. Input the name and email address of the primary point of contact for information about the printer. This page also shows the printer’s network names, addresses, and printer model information.

Networking page set

This set of pages allows the network administrator to configure the HP JetDirect card for the printer. Refer to the online Help and to the *HP JetDirect Print Server Administrator's Guide* for more information.

WWW To download the *HP JetDirect Print Server Administrator's Guide*, go to http://www.hp.com/support/lj4550. When you connect, select **Manuals**.

Printer configuration page

Printing a printer configuration page can help you verify that the printer is configured properly. This can be useful in troubleshooting printer problems.

To print a printer configuration page

1 On the printer control panel, press [MENU] until INFORMATION MENU appears.

2 Press [ITEM] until PRINT CONFIGURATION appears.

3 Press [SELECT] to print the configuration page. The printer will return to the READY state.

Note If the printer is configured with EIO cards (for example, an HP JetDirect Print Server), an additional configuration page will print that provides interface configuration information.

Interpreting the printer configuration page

The following sample illustrates a printer configuration page.

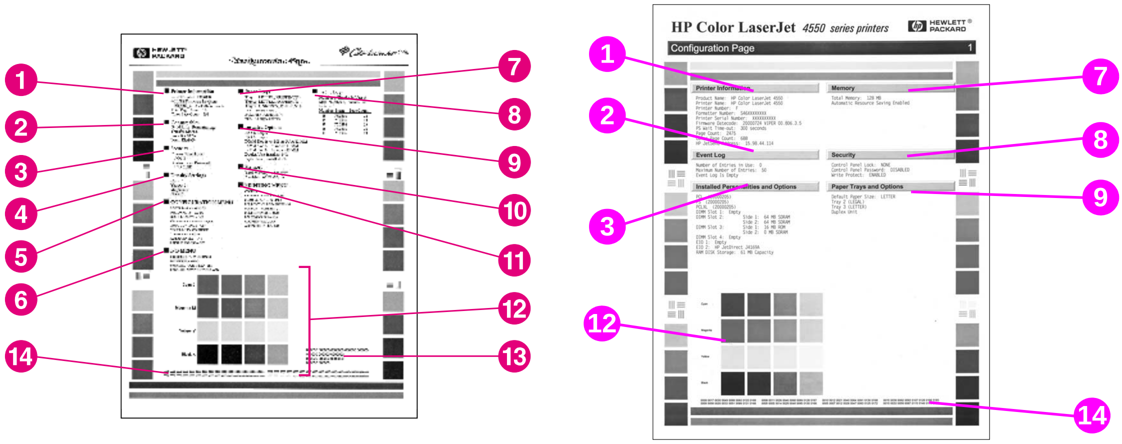


Figure 7-13 **4500 series (left) and 4550 series (right) printer configuration page**

1 **Printer information**—Lists the printer serial number, PCL/Emulated PostScript firmware revision, total number of pages printed during the life of the printer, and total number of color pages printed during the life of the printer.

2 **Event log**—Lists the last five printer events, including printer jams, service errors, and other printer conditions.

3 **Installed personalities and options**—Lists installed options such as EIO cards, DIMMs, duplex printing accessory, and 500-sheet paper feeder.

4 **I/O menu**—(Color LaserJet 4500 series only) Lists the current settings of the I/O menu items.

5. **Configuration menu**—(Color LaserJet 4500 series only) Lists the current settings of the configuration menu items.
6. **Printing menu**—(Color LaserJet 4500 series only) Lists the current settings of the printing menu items.
7. **Memory**—Shows the total memory installed and the total memory available in the printer. Also lists the memory allocation settings.
8. **Security**—Shows whether the printer control panel is locked or unlocked. Also shows whether the printer control panel password is enabled or disabled.
9. **Paper trays**—Lists the size and type of media currently configured for each input tray. Also lists the current Tray 1 mode, A4/letter override setting, and default size setting.
10. **Density settings**—(Color LaserJet 4500 series only) Lists the current density settings.
11. **Printing Menu**—(Color LaserJet 4500 series only) Lists the current settings of the printing menu items.
12. **Color blocks**—The color blocks verify color printing ability of the printer. The color blocks in the middle of the page are primary colors, and the color blocks surrounding the page are secondary colors. Each color is shown in 100-, 75-, 50-, and 25-percent fill.
13. **Printer usage information**—(4500 series only; 4550 series usage information is on the Usage Page) Shows the number of pages printed for the following items:

Row 1: Paper size

000000	000000	000000	000000	000000
Custom	Envelope	Legal	Executive/B5	Letter/A4

Row 2: Fuse modes

000000	000000	000000	000000	000000
Normal	Heavy	OHT	Gloss	Envelope

Row 3: Source tray

000000	000000	000000	000000
Tray 1	Tray 2	Tray 3	Duplex

Row 4: Language

000000	000000	000000
PCL pages	PS pages	XL pages

Row 5: Media types

000000	000000	000000	000000	000000	000000
Plain	Pre-printed	Letterhead	Transparency	Prepunched	Labels

Row 6: Media types

000000	000000	000000	000000	000000	000000
Bond	Recycled	Color	Card	Gloss	Heavy

Row 1: Paper size

Note For rows one to three, the page count is incremented after every ten pages. Row four is incremented after every end of page. Rows one to four are counted through the engine. Rows five and six are driver requests.

The tray count is incremented based on the tray that is selected by the firmware, not the tray that is selected by the user.

Media size count is incremented based on the media size that is selected by the user. Media type count is incremented based on 1) the media type that is selected by the user when the media is pulled from tray 1; and 2) the media type configured on the tray when media is pulled from tray 2 or tray 3.

Fuse mode count is incremented twice for duplexed sheets, once when the front side is fused and once when the back side is fused.

14 **Calibration density settings**—On the bottom row of text, there are four separate blocks of numbers. The first block is for cyan, second for magenta, third for yellow, and the last is for black. Make sure the numbers are not near zero (if so, no calibration was done).

Note Do not print the configuration page until the printer is ready or calibration will not occur.

Supplies status page

The supplies status page shows the remaining life for the following printer consumables and kits:

- toner cartridges (all colors)
- drum kit
- transfer kit
- fuser kit

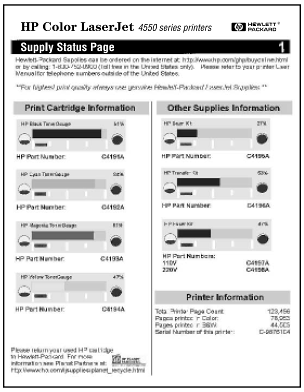
It also lists useful printer information including the total number of pages printed (in monochrome and in color), the printer serial number, and the part numbers for the supplies.

To print the supplies status page

1. On the printer control panel, press MENU until `INFORMATION MENU` appears.
2. Press ITEM until `PRINT SUPPLIES STATUS PAGE` appears.
3. Press SELECT to print the supplies status page. After the process is completed, the printer will return to the `READY` state.

Interpreting the supplies status page

The following sample illustrates a supplies status page.



HP Color LaserJet *4550 series printers*

Supply Status Page

Print Cartridge Information

HP Part Number: C4191A

HP Part Number: C4192A

HP Part Number: C4193A

HP Part Number: C4194A

Other Supplies Information

HP Part Number: C4195A

HP Part Number: C4196A

HP Part Numbers:
110V C4197A
220V C4198A

Printer Information

Figure 7-14 **Supplies status page**

Print cartridge information

1. Black Toner Gauge
2. Cyan Toner Gauge
3. Magenta Toner Gauge
4. Yellow Toner Gauge

Other supplies information

5. Imaging drum kit
6. Transfer kit
7. Fuser kit

Printer information

8. Printer usage totals

Usage page

The usage page lists a page count for each size of media that has passed through the printer. This page count includes the number of pages that were printed on one side, the number that were printed on two sides (duplexed), and totals of the two printing methods for each media size. It also lists the average percentage of page coverage for each toner color.

To print the usage page

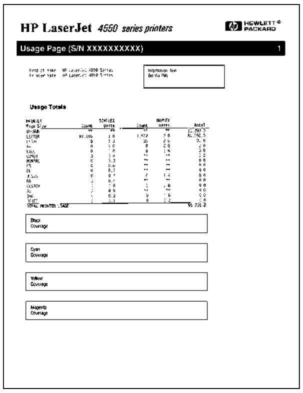
1 On the printer control panel, press MENU until `INFORMATION MENU` appears.

2 Press ITEM until `PRINT USAGE PAGE` appears.

3 Press SELECT to print the usage page. After the process is completed, the printer will return to the READY state.

Interpreting the usage page

The following sample illustrates a usage page.



HP LaserJet 4550 series printers

Usage Page (S/N XXXXXXXXXX) 1

Usage Totals

Black Coverage

Cyan Coverage

Yellow Coverage

Magenta Coverage

Figure 7-15 **Usage page**

1 Usage totals (all media sizes)

2 Black coverage

3 Cyan coverage

4 Yellow coverage

5 Magenta coverage

Event log

Detailed service information is noted in the event log. The following is a list of the types of messages logged in the event log:

- jam errors
- EIO errors
- catastrophic errors

The last 50 errors are listed with the most recent error listed first. The event log can be viewed either on the control panel display or it can be printed from the control panel.

To view the event log on the printer's control panel

1. Press [MENU] until INFORMATION MENU appears on the control panel display.
2. Press [ITEM] until SHOW EVENT LOG appears on the display.
3. Press [SELECT] to view the event log on the control panel display.
4. Press [GO] to bring the printer back online.

To print the event log (4500 series)

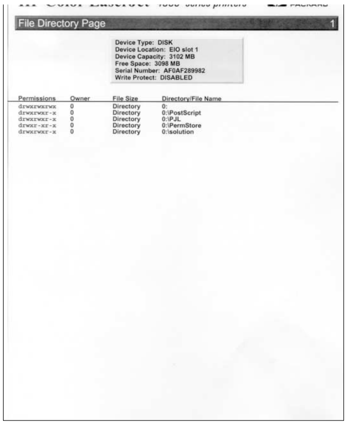
1. Access the printer's service mode (see page 293).
2. Press [ITEM] until PRINT CONFIGURATION appears.
3. Press [SELECT] to print the configuration page. Up to 50 events will be printed on the configuration page.

To print the event log (4550 series)

1. On the printer control panel, press MENU until INFORMATION MENU displays.
2. Press ITEM until PRINT EVENT LOG displays.
3. Press SELECT to print the event log. After the process is completed, the printer will return to the READY state.

Hard disk file directory page

Information about the optional 5 GB hard disk is listed on the Hard Disk File Directory page.



File Directory Page 1

Device Type: DISK
Device Location: EIO slot 1
Device Capacity: 3102 MB
Free Space: 3098 MB
Serial Number: AF0AF289982
Write Protect: DISABLED

Permissions	Owner	File Size	Directory/File Name
drwxrwxrwx	0	Directory	0:
drwxrwxr-x	0	Directory	0:\PostScript
drwxrwxr-x	0	Directory	0:\PJL
drwxr-xr-x	0	Directory	0:\PermStore
drwxrwxr-x	0	Directory	0:\solution

Figure 7-16 **Hard disk file directory page**

Service mode

Service mode allows for the modification of page counts and certain registration values for the printer. In the 4500 series, when the configuration page is printed while in service mode all event log messages (up to 50 events) will be printed. In the 4550 series, the event log is printed from the Information menu. If both the formatter and DC controller are replaced at the same time, service mode will be utilized to execute the color plane registration sequence that ensures optimum print quality.

Accessing the service mode

1. Hold down [CANCEL JOB] and [SELECT] while turning the printer on until the display is blank and the three LEDs are on.
2. Press the right side of the [MENU +] key, and then press [SELECT].

SERVICE MODE will appear on the front panel briefly followed by two rows of asterisks. The printer will go through its normal start-up cycle, and then display SERVICE MODE on the front panel again. Below is a menu map showing what is available in service mode.

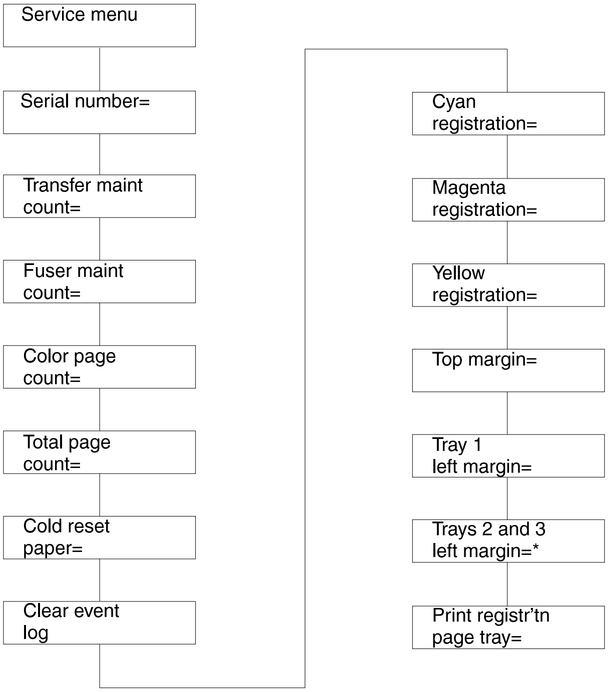
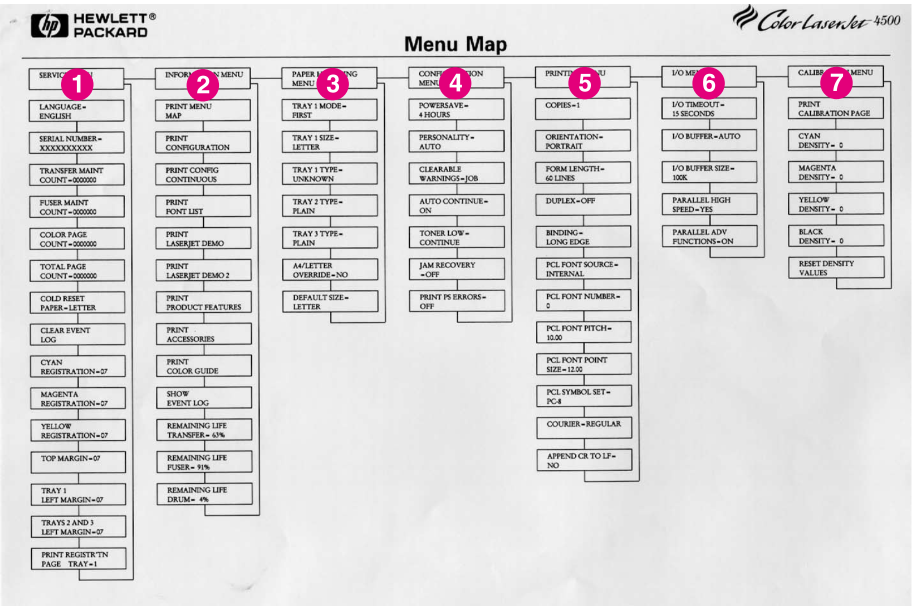

Service menu
Serial number=
Transfer maint count=
Fuser maint count=
Color page count=
Total page count=
Cold reset paper=
Clear event log
Cyan registration=
Magenta registration=
Yellow registration=
Top margin=
Tray 1 left margin=
Trays 2 and 3 left margin=*
Print registr'tn page tray=

Figure 7-17 **Service mode menu map**

Printing the menu map in service mode

Printing the menu map while in service mode provides access to the Service Menu as well as other control panel menus and their settings.



HEWLETT® PACKARD

Color LaserJet 4500

Menu Map

SERVIC U
- LANGUAGE= ENGLISH
- SERIAL NUMBER= XXXXXXXXXX
- TRANSFER MAINT COUNT=0000000
- FUSER MAINT COUNT=0000000
- COLOR PAGE COUNT=0000000
- TOTAL PAGE COUNT=0000000
- COLD RESET PAPER=LETTER
- CLEAR EVENT LOG
- CYAN REGISTRATION=07
- MAGENTA REGISTRATION=07
- YELLOW REGISTRATION=07
- TOP MARGIN=07
- TRAY 1 LEFT MARGIN=07
- TRAYS 2 AND 3 LEFT MARGIN=07
- PRINT REGISTR'TN PAGE TRAY=1

INFOR N MENU
- PRINT MENU MAP
- PRINT CONFIGURATION
- PRINT CONFIG CONTINUOUS
- PRINT FONT LIST
- PRINT LASERJET DEMO
- PRINT LASERJET DEMO 2
- PRINT PRODUCT FEATURES
- PRINT ACCESSORIES
- PRINT COLOR GUIDE
- SHOW EVENT LOG
- REMAINING LIFE TRANSFER= 63%
- REMAINING LIFE FUSER= 91%
- REMAINING LIFE DRUM= 4%

PAPER H NG MENU
- TRAY 1 MODE= FIRST
- TRAY 1 SIZE= LETTER
- TRAY 1 TYPE= UNKNOWN
- TRAY 2 TYPE= PLAIN
- TRAY 3 TYPE= PLAIN
- A4/LETTER OVERRIDE=NO
- DEFAULT SIZE= LETTER

CONFI TION MENU
- POWERSAVE= 4 HOURS
- PERSONALITY= AUTO
- CLEARABLE WARNINGS=JOB
- AUTO CONTINUE= ON
- TONER LOW= CONTINUE
- JAM RECOVERY =OFF
- PRINT PS ERRORS= OFF

PRINTI NU
- COPIES=1
- ORIENTATION= PORTRAIT
- FORM LENGTH= 60 LINES
- DUPLEX=OFF
- BINDING= LONG EDGE
- PCL FONT SOURCE= INTERNAL
- PCL FONT NUMBER= 0
- PCL FONT PITCH= 10.00
- PCL FONT POINT SIZE=12.00
- PCL SYMBOL SET= PC-8
- COURIER=REGULAR
- APPEND CR TO LF= NO

I/O ME
- I/O TIMEOUT= 15 SECONDS
- I/O BUFFER=AUTO
- I/O BUFFER SIZE= 100K
- PARALLEL HIGH SPEED=YES
- PARALLEL ADV FUNCTIONS=ON

CALIBR MENU
- PRINT CALIBRATION PAGE
- CYAN DENSITY= 0
- MAGENTA DENSITY= 0
- YELLOW DENSITY= 0
- BLACK DENSITY= 0
- RESET DENSITY VALUES

Figure 7-18 HP Color LaserJet 4500 series Service menu map

1 Service Menu

2 Information Menu

3 Paper Handling Menu

4 Configuration Menu

5 Printing Menu

6 I/O Menu

7 Calibration Menu

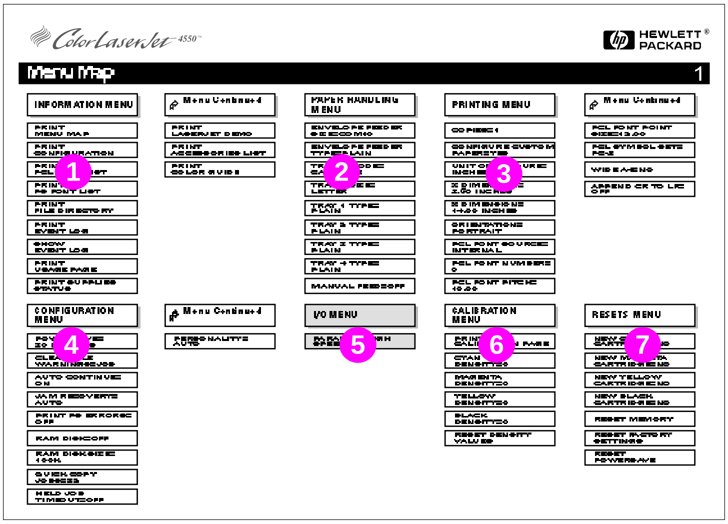

ColorLaserJet 4550
HEWLETT PACKARD
Menu Map
1
INFORMATION MENU
Menu Continued
PAPER HANDLING MENU
PRINTING MENU
Menu Continued
CONFIGURATION MENU
Menu Continued
I/O MENU
CALIBRATION MENU
RESETS MENU
1
2
3
4
5
6
7

Figure 7-19 **HP Color LaserJet 4550 series Service menu map**

1 Information menu

2 Paper Handling Menu

3 Printing Menu

4 Configuration Menu

5 I/O Menu

6 Calibration Menu

7 Resets menu

8 Quick Copy Jobs menu (only shown if a hard disk or RAM disk is installed)

9 Private/Stored Jobs menu (only shown if a hard disk or RAM disk is installed)

Note Some menus only appear when the hard disk is installed.

Description of Service Menu items

The following menu items should be used by trained service personnel only. These items are used to ensure the printer functions properly.

Serial number

The serial number displayed on the front panel should match the serial number tag located on the rear of the printer, as this is the serial number printed on the configuration page.

Setting the serial number:

1. Press the [ITEM] key until `SERIAL NUMBER =` (number) appears.
2. Press the [VALUE +/–] key to change the character with the cursor under it.
3. Press [SELECT] to save the character and move the cursor to the next slot.
4. Repeat steps 2 and 3 until all the characters match the label on the back of the printer.

Transfer maintenance count

There are two methods to track the life of the intermediate transfer belt (ITB):

- The life lever on the ITB actually indicates when the ITB has reached its end of life.
- The transfer maintenance count (printed on the configuration page) shows the percent of life used. This number is not critical to printer operation, but it provides a way for customers to monitor consumable life. The transfer maintenance count is set to zero when the life message for the ITB is reset. If you replace the ITB before the end of life message appears, you also need to set this value to zero.

Setting transfer maintenance count

1. Press the [ITEM] key until transfer maintenance count appears.
2. Press the [VALUE +/–] key to set the number.
3. Press [SELECT] to save.
4. Repeat steps 2 and 3 to change the other numbers if required.

Fuser maintenance count

The fuser maintenance count functions the same way as other HP LaserJet printers. This count is the actual life of the fusing unit and is used to indicate its end of life. If the fuser is replaced before the end of life message appears, the fuser count must be reset to zero. An actual end of life condition will have a reset to clear the end of life message and set the fuser count to zero.

Setting fuser maintenance count:

1. Press the [ITEM] key until `FUSER MAINTENANCE COUNT` appears.
2. Press the [VALUE +/–] key to set the number.
3. Press [SELECT] to save.
4. Repeat steps 2 and 3 to change the other numbers if required.

Color page count

Color page count is used to track the number of pages printed with any color other than black. Although this count is not critical, there might be customers who use it to track the number of color documents printed. If the number needs to be reentered, select a number which is as close as possible to the original. An earlier configuration page is a great source if one can be found.

Setting color page count:

1. Press the [ITEM] key until `COLOR PAGE COUNT` appears.

2 Press the [VALUE +/–] key to set the number.

3 Press [SELECT] to save.

4 Repeat steps 2 and 3 to change the other numbers if required.

Total page count

Total page count tracks the total number of pages printed. As with the color page count, the number is not critical but can be useful for customers.

Setting total page count:

1 Press the [ITEM] key until `TOTAL PAGE COUNT` appears.

2 Press the [- VALUE +] key to set the number.

3 Press [SELECT] to save.

4 Repeat steps 2 and 3 to change the other numbers if required.

Clear event log

Clear event log (event log empty) does exactly what it says. There can be times when it is necessary to clear the event log to allow the tracking of an issue. To clear the event log press the [SELECT] key. Once the event log is cleared it will read event log empty.

The next items in the list deal with color plane registration along with top and left margin settings for the different trays. Please refer to the registration page section for an explanation of these settings and how to set them.

Paper tray size functional test

Use the status/test feature of the service mode to check the function of the paper tray size switches. See the status/test address table in this chapter for information about this test.

Registration page

Note You must set the registration values if both the formatter and DC controller are replaced at the same time or if the formatter had been previously installed in another printer. If the DC controller is replaced by itself, these values are copied from the formatter to the DC controller. If a new formatter is replaced, or if an NVRAM initialization is performed (see NVRAM initialization on page 307), these values are loaded onto the formatter from the DC controller.

Registration offset—As the ITB ages, the Color Plane Registration might need to be checked. See the instructions below for printing a registration page.

Registration offset has also occurred when a printer has been damaged and the scanner itself was offset.

To print a registration page:

1 Scroll through the Service Menu until `PRINT REGISTRATION PAGE` appears.

2 Select which paper tray to pull paper from (only when setting left side margins will the tray actually matter).

3 Press [SELECT] to print the registration page.

In the center of the page are horizontal (Scan) and vertical (Process) sets of bars for cyan, magenta, and yellow. Each bar is made up of a series of lines, with black being used as the base for setting the correct registration values for the three other colors. Along the top and left sides of the page are lines with numbers which are used for top and left side margins. The tray from which paper was pulled is listed on the bottom of the page.

To set registration numbers

On each of the color bars in the process section are bolded numbers that indicate the current number set on the control panel. These bolded numbers will always be in the middle of the bars. To set the correct value for each of the colors, look at the lines within the bar and find the grouping that has the color line directly on top of the black line (it will have more white space). Print at least five registration pages to see if the new settings are correct.

Hint Using a magnifying glass to look at the lines will help in selecting the best number.

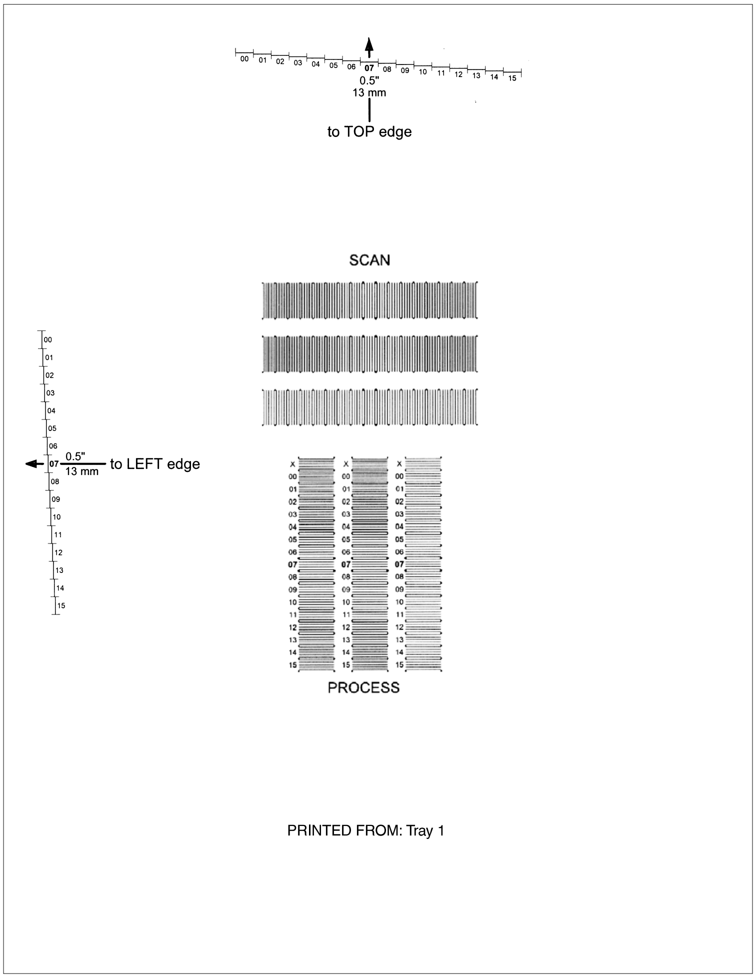


Figure 7-20 **Registration page**

Note **Hewlett-Packard strongly recommends that the registration values be selected on the basis of averaging five consecutive samples.**

Setting the registration number:

1. Press the [ITEM] key to select the appropriate color (cyan, magenta, or yellow) at its registration number.
2. Press the [VALUE +/–] key to change the registration number to the one identified.
3. Press the [SELECT] key to enter the value.

Setting margin numbers

The top margin number is not tray-dependent like the left side margin. Simply print the registration page from whichever tray has paper. Using a ruler, measure from the top edge of the paper to the series of lines. Find the line that is 13 mm (0.5 in) away from the paper's edge.

Setting the top margin registration value

1. Press the [ITEM] key to scroll through the service menu until top margin appears.
2. Press the [MENU +/–] key until the number to be entered appears.
3. Press the [SELECT] key to enter the number.

Print another registration page and the number just entered will align with the arrow and be printed in bold.

The left side margin setting is tray dependent. Tray 1 has its own number while trays 2 and 3 are combined. The procedure is the same as the top margin with one exception. The page must be printed from the tray that will be adjusted.

Printing from tray 1

1. Press the [ITEM] key until `PRINT REGISTRATION PAGE TRAY =1` (default) appears.
2. Press the [SELECT] key.
3. Measure from the left side of the paper to the lines and find the line which is 13 mm (0.5 inches) from the edge.

If the number for the line is different than the current number:

1. Press the [ITEM] key until `TRAY 1 LEFT MARGIN = #` appears.
2. Press the [VALUE] key to change the number to the number required.
3. Press the [SELECT] key.

Printing from tray 2 and 3

1. Press the [ITEM] key until `PRINT REGISTRATION PAGE TRAY = 2` or `3` appears.
2. Press the [SELECT] key.
3. Measure from the left side of the paper to the lines and find the line which is 13mm (0.5 inches) from the edge.

If the number for the line is different than the current number:

1. Press the [ITEM] key until `TRAY 2 AND 3 LEFT MARGIN = #` appears.
2. Press the [VALUE] key to change the number to the number required.
3. Press the [SELECT] key.

Diagnostics mode

This section provides an overview of the diagnostic tools incorporated into the HP Color LaserJet 4500/4500N/4500DN printer and the HP Color LaserJet 4550/4550N/4550DN/4550HDN printer.

CAUTION Take caution when performing printer diagnostics to avoid risk of injury. Only trained service personnel should access the diagnostics mode with the skins removed.

There are two diagnostic sections built into the firmware, one for the formatter and the other for the engine. Each section contains different tests that allow the service technician to verify printer functionality. While in diagnostics mode there are no error messages associated with these tests. Therefore, determination of the problem will rely on the technician's skill. To exit diagnostics mode, turn off the printer.

Note In the 4550 series, you can abort a test run by pressing the [CANCEL JOB] key and holding it down until the display shows the menu again. In some cases, it will take several seconds. To cancel the NVRAM test while it is running, press the [CANCEL JOB] key and hold it down until the display show the menu again. NVRAM is put back in its original form, and an error is logged in the Fault log.

When the Attention LED is on, then there ahs been an error in the test. Press the [MENU] key to get to the Fault log menu, the [ITEM] key to see the different log messages, and the [-VALUE+] key to scroll the message back and forth.

Entering diagnostics mode

1 To open diagnostics mode, hold down the left side of the [ITEM] key and turn on the printer.

Formatter diagnostics

Formatter diagnostics are designed to be used by qualified service personnel to thoroughly test the functionality of the formatter. If all the tests pass, the formatter is working correctly and it can be assumed that the problem resides elsewhere. Listed below are descriptions of the formatter tests available.

Table 7-27 Formatter diagnostics

Test	Description
REPEAT	If set to YES, the tests will run continuously until interrupted. In the **4550 series only**, [CANCEL JOB] will abort the test.
ON FAULT	The following will occur for each setting: BREAK - the test will stop when a failure occurs. PAUSE - the test will stop for a short period of time then resume with the remaining tests. CONT - the tests will continue even when a failure occurs.
ROM CRC	**4500 series only.** Tests the firmware ROM for correct functionality.
DRAM	Tests the on-board RAM and the DIMMs.
SRAM 1	Tests the SRAM inside the ASIC.
SRAM 2	Tests the SRAM physically mounted on the formatter.

Table 7-27 Formatter diagnostics

Test	Description
NVRAM	**CAUTION** Do not interrupt the NVRAM test. Doing so will cause the printer to lose all NVRAM values. In almost all cases, this test should not be run. Tests the formatter NVRAM. This test takes 15-18 minutes to run and should only be used when NVRAM values are being lost. In the **4550 series only**, [CANCEL JOB] will abort the test. Do not turn off the printer or corruption of the NVRAM could result; if the NVRAM test must be aborted, use the [CANCEL JOB] key.
EXECUTE TESTS	Runs the selected tests.

Engine diagnostics

Engine diagnostics access portions of the printer's internal diagnostics that occur when the printer is turned on. These diagnostics are available as tools to help isolate problems that are not reported by the firmware. As mentioned previously, no error message will appear if there is a problem in the section being tested. A good understanding of how the printer operates is required to use the engine diagnostics successfully.

To have a better view of the areas being exercised, remove the left side cover and the ITB drawer. Defeat the two ITB drawer switches (SW 1 and SW 4) located on the left-side of the drawer cavity. Now you can run the diagnostics and watch the assemblies as they are operated.

Listed below in (Table 7-28) are the diagnostics available and a brief description of what each diagnostic will do. A detailed explanation for each diagnostic can be found under its own heading later in this document.

Table 7-28 Engine diagnostics

Menu Item	Selectable Value	Description
CONTINUOUS	N (default) Y	Selected test will run once. Selected test will run in a continuous loop. In the **4550 series only**, [CANCEL JOB] will abort the test.
PAPER PATH TEST		Turns on the motors that control the paper path section of the printer. In the **4550 series only**, [CANCEL JOB] will abort the test.
DEVELOPER TEST		Rotates the carousel and the developers. In the **4550 series only**, [CANCEL JOB] will abort the test.
DRUM TEST		Turns on the drum drive motor that drives the drum and ITB. In the **4550 series only**, [CANCEL JOB] will abort the test.
PATH SENSORS		Displays the state for each of the paper path sensors and switches. In the **4550 series only**, this test will continue running until the [CANCEL JOB] key is pressed.
DOOR SENSORS		Displays the state for each of the door and drawer switches. In the **4550 series only**, this test will continue running until the [CANCEL JOB] key is pressed.

Paper path test

1 Press the [ITEM] key until you see ENGINE DIAGS PAPER PATH TEST.

2 Press the [SELECT] key to activate the test. While the test is running you will see ENGINE DIAGS E1:PAPERPATH displayed in the front panel.

The test takes approximately 15 seconds to run.

Components exercised by the paper path test include the fusing motor (M1), paper path pick-up motor (M2), and associated gears and assemblies. The paper pick up roller for tray 2 can be activated by manually activating the paper pick solenoid (SL2). This test will not pick up paper and move it through the paper path. To test this function, simply run a configuration page. For multiple pages, select continuous configuration page in the control panel.

The paper path test allows the service technician to verify the operation of components within the paper path. When the test is initiated both the M1 and M2 are activated. You will see the ITB lift cams rotate once and the ITB drive gear turn briefly. The remaining portion of the test simply allows both the M1and M2 to run, thus exercising the gears and rollers associated with them.

Note If an error occurs during the paper path test, the message `PATH_1PAPER PATH TEST FAILED` appears.

Developer test

The developer test rotates the carousel stopping at each toner cartridge and rotating the developer sleeve. For the best view of the carousel and the toner cartridge sleeves, remove the drum cartridge. The drum drawer must be closed before the test can run.

1. Press the [ITEM] key until `ENGINE DIAGS DEVELOPER TEST` appears.
2. Press the [SELECT] key to run the test. The front panel will display `ENGINE DIAGS E2:DEVELOPER` while the test is running. Watch the carousel and make sure the toner cartridge developer sleeve rotates. The sequence will be black followed by a pause, then magenta, cyan, and finally yellow.

The test will last for approximately 35 seconds. While the developer test is running you will see the drum turn if it is installed, as well as the drive gear for the ITB.

Drum test

The drum test exercises the drum drive mechanism. Also, the fuser motor is turned on to allow the lift cams for the ITB to be rotated into the ITB up position.

1. Press the [ITEM] key until `ENGINE DIAGS DRUM TEST` appears.
2. Press the [SELECT] key to run the test. The front panel will display `ENGINE DIAGS E3:DRUM` while the test is running.

Watch to see if the ITB lift cams turn and if both the drum drive gear and the ITB drive gear are rotating.

Path sensors test

The path sensors test allows the paper path sensors and switches to be tested for correct operation. Table 7-29 shows the correlation between the identifier on the front panel and the sensor or switch it represents.

Table 7-29 Paper path sensors and switches

Identifier	Name	Description
A	PS8	Tray 2 paper detect sensor
B	PS3	Tray 1 last sheet of media pulled sensor
C	PS4	Tray 1 paper detect sensor
D	SW801	Tray 2 paper size switch 2
E	SW802	Tray 2 paper size switch 1
F	SW803	Tray 2 paper size switch 0
G	PS3001	Optional Tray 3 paper detect sensor
H	SW3001	Optional Tray 3 paper size switch 2
I	SW3002	Optional Tray 3 paper size switch 1
J	SW3003	Optional Tray 3 paper size switch 0
K	PS10	Carousel position sensor

Table 7-29 Paper path sensors and switches (continued)

Identifier	Name	Description
L	PS11	ITB photo sensor
M	N/A	500-sheet feeder: 1=installed, 0=uninstalled
N	PS9	Top output tray full sensor

1 Press the [ITEM] key until `ENGINE DIAGS PATH SENSORS` appears on the front panel.

2 Press the [SELECT] key to activate the test. The front panel will display A through N with a binary value below it.

When running this test, make sure the ITB drawer is installed and trays 2 and 3 are removed. In this state the default value on the front panel should be: 0X111111110010, where the x can be either a 0 or 1. If there is any other value, then there is a possible problem. Identify the sensor or switch in the table above and test to see if the value changes. Cassette paper size settings for each tray are described in Table 7-30.

Table 7-30 Paper size settings

Paper Size	Tray 2 Switches (DEF)	Tray 3 Switches (HIJ)
A4	000	000
B5	001	001
Custom (A5)	010	011*
Custom (B5 ISO)	011	011*
Letter	100	100
Executive	101	101
Legal	110	110
No tray installed	111	111

* These values are the same for Tray 3.

Door sensor test

The door sensor test allows service personnel to open and close doors on the printer while watching the sensor status on the front panel. Switches 4 and 5 are in series with each other which causes the value to toggle under identifier A.

Once the door sensor test is initiated, the front panel displays the status for each sensor listed in Table 7-31. As a door is opened and closed the state of the sensor changes the indicator values on the front panel.

Table 7-31 Sensor status

Identifier	Name	Description
A	SW4 and SW5	Front and rear door switches
B	SW1 *	ITB drawer switch
C	SW2 *	Toner cartridge door *
D	SW3 *	Drum drawer switch *
E	Drum detect	Detect if a drum cartridge is installed

Table 7-31 Sensor status

Identifier	Name	Description
F	Fuser	Detects if fuser is installed. Changes state if not detected or removed when rear door is opened and closed.

* Activates (A) as well when opened.

1 Press the [ITEM] key until ENGINE DIAGS DOOR SENSORS appears on the front panel.

2 Press the [SELECT] key to activate the test.

The front panel will display A through F with a binary value below it. All the doors and drawers should be closed. In this state the display will show all 0's. Open the doors and drawers one at a time to verify correct functionality. If operating correctly, the 0 will change to a 1. If a 1 appears with all doors and drawers closed, there is a defective switch or connection.

Engine test

The printer has one test pattern (vertical lines). When an image defect appears, a test print can be made to identify the problem. The test print can be made by pressing the test print switch located on the right side of the printer (Figure 7-21). A test pattern can be printed by pressing the test print switch once after the photosensitive drum has stopped and the printer has entered the standby mode. If the switch is held down, the test pattern is printed continuously. The switch can be used when paper is loaded in any tray other than tray 1.

The engine test does the following:

- Verifies that the print engine is functioning correctly (the formatter PCB is completely bypassed during an engine test).
- Isolates printer problems.
- Checks and adjusts registration.
- Prints from tray 2 or 3 only, not from tray 1.
- Can be activated with the formatter PCB removed.

Note For the printer to perform an engine test, tray 2 must be installed and loaded with paper, and the toner cartridge must be installed in the printer.

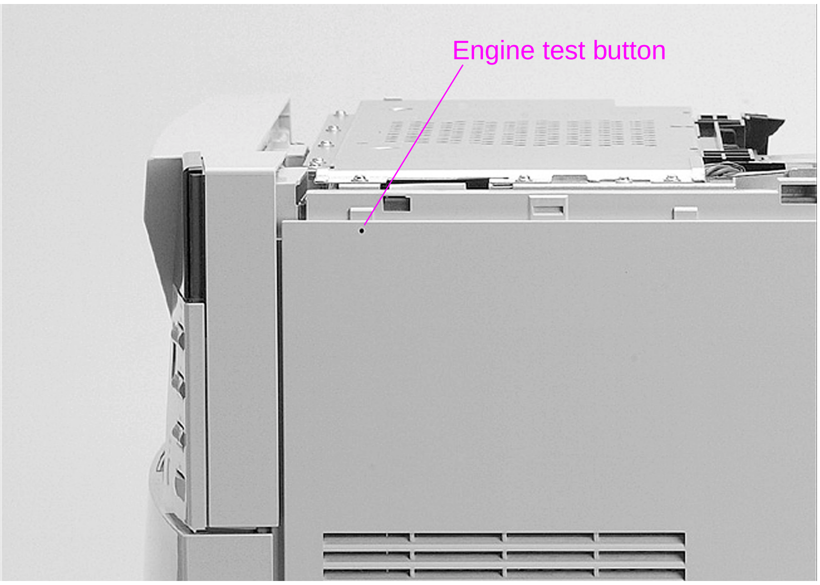


Figure 7-21 **Location of the engine test button**

NVRAM initialization

NVRAM initialization should always be executed immediately after replacing the firmware or the formatter board. This procedure aligns the firmware with the formatter. Not performing NVRAM initialization could result in deterioration of print quality. Before initializing NVRAM, be sure to gather and write down the information listed below, if possible.

- Total page count and color page count. Print a configuration page to obtain both page counts and the serial number.
- Percentage of life remaining for both the transfer kit and the fuser kit
  a. From SERVICE MODE on the printer display panel, press [MENU].
  b. Go to SERVICE MENU and press [ITEM].
  c. Use the [-VALUE +] keys to go to TRANSFER MAINT COUNT=XXXXXXX and write down the exact numbers shown.
  d. Go to FUSER MAINT COUNT=XXXXXXX and write down the exact numbers shown.
- Serial number.

To initialize NVRAM

1 Turn on the printer while holding down both the [CANCEL JOB] and [SELECT] keys until all the LED lights are on, then release the keys.

2 Press [CANCEL JOB].

3 Press [SELECT].

After replacing the firmware or the formatter board, the following settings are changed or lost. If you do not wish to accept the new values, use Service Mode to enter the previous settings that you wrote down before initializing.

- Total page count and total color page count (the counter is reset to 0)
- Transfer kit percentage of life remaining (gauge is reset to 100 percent)
- Fuser kit percentage of life remaining (gauge is reset to 100 percent)
- Printer serial number

Diagrams

This section contains wiring diagrams and photos of all internal printer components.

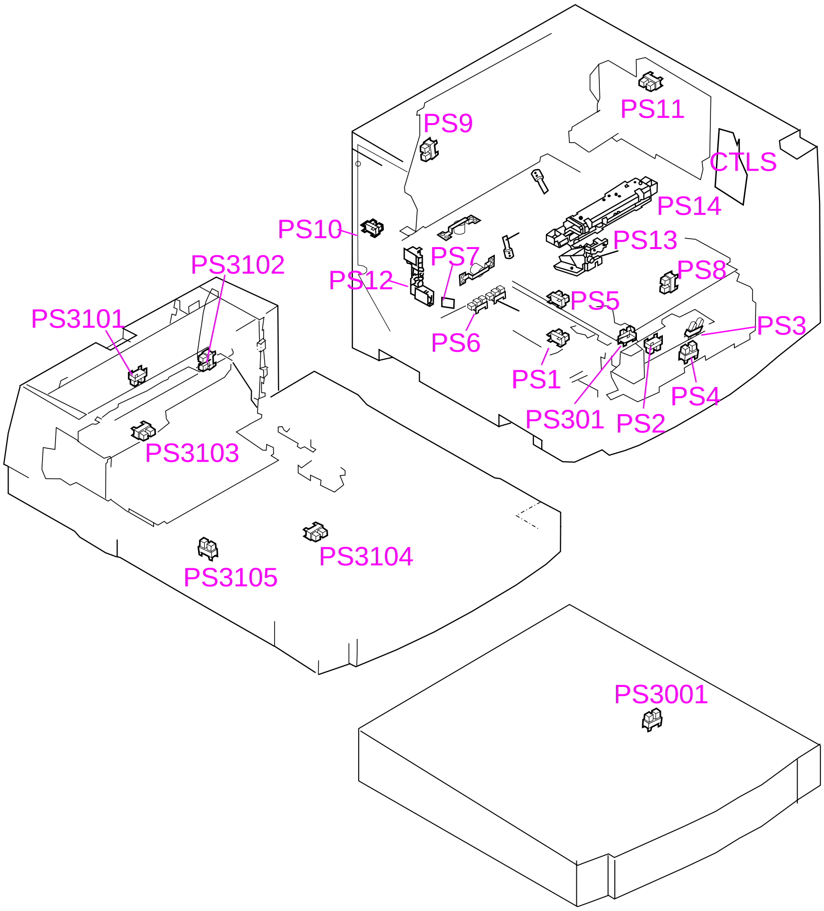

PS9
PS11
CTLS
PS14
PS10
PS13
PS3102
PS7
PS12
PS8
PS3101
PS5
PS3
PS6
PS1
PS4
PS301
PS2
PS3103
PS3104
PS3105
PS3001

Figure 7-22 **Sensor locations**

Table 7-32 Sensor function and locations

Name	Function
PS1	ITB unit life sensor
PS2	Registration paper sensor
PS3	Last paper sensor
PS4	Multipurpose tray paper sensor
PS5	ITB home position sensor
PS6	Fusing unit pressure release sensor
PS7	Delivery paper sensor
PS8	Cassette paper sensor
PS9	Face-down tray paper full sensor
PS10	Carousel home position sensor
PS11	Toner cartridge press sensor
PS12	Toner level sensor

Table 7-32 Sensor function and locations (continued)

Name	Function
PS13	Waste toner sensor
PS14	Density sensor
PS301	OHT sensor (multipurpose tray PCB)
PS3001	Paper feed detection sensor
PS3101	Reversing unit paper sensor
PS3102	Face-up sensor
PS3103	Reversing unit stationary paper sensor
PS3104	Duplex pick-up paper sensor
PS3105	Side registration home position sensor
CTLS	Continuous toner level sensor

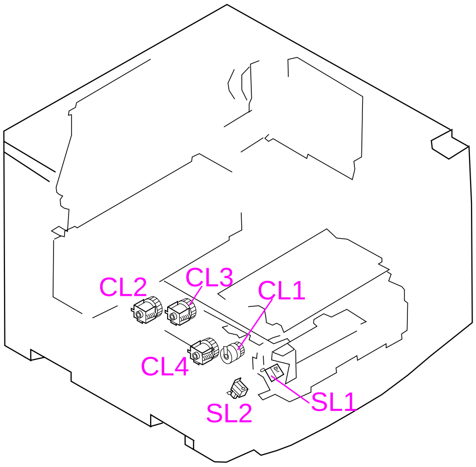


Figure 7-23 Printer solenoids and clutches

Table 7-33 Solenoid and clutch functions and locations

Name	Function
SL1	Multipurpose tray pick-up solenoid
SL2	Paper pick-up solenoid
CL1	Registration clutch
CL2	ITB unit separation clutch
CL3	ITB cleaning roller separation clutch
CL4	Secondary transfer roller separation clutch

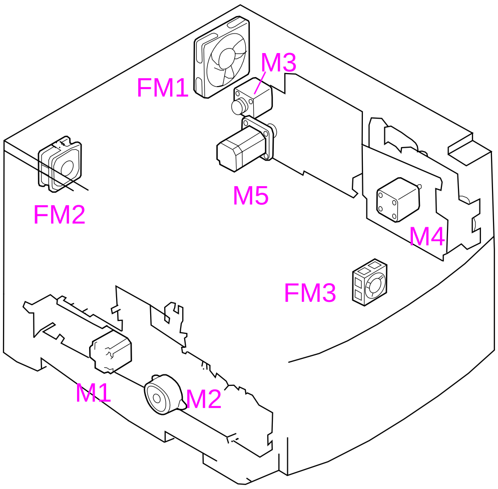


Figure 7-24 Printer motors and fans

Table 7-34 Printer motors and fans

Name	Code	Description
Motors	M1	Fusing motor
	M2	Pick-up motor
	M3	Carousel motor (carousel drive unit)
	M4	Drum motor (drum drive unit)
	M5	Toner cartridge motor
Fan Motors	FM1	Large fan
	FM2	Small fan
	FM3	Fan (upper front cover fan)

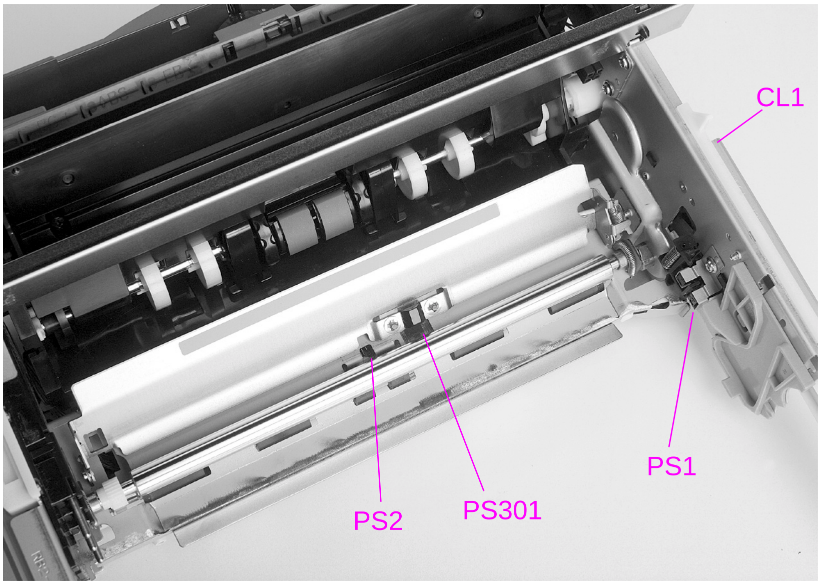


Figure 7-25 Miscellaneous sensors and clutches

Table 7-35 Miscellaneous sensors and clutches

Name	Description
PS2	Registration sensor
PS301	Overhead transparency sensor
PS1	Intermediate transfer belt life sensor
CL1	Registration clutch (on outside drawer wall)

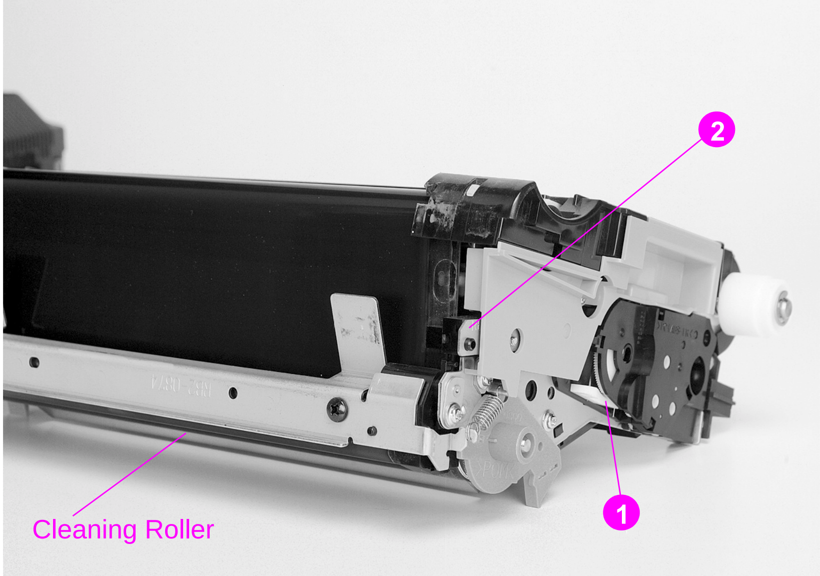


Figure 7-26 Intermediate transfer belt sensors

Table 7-36 Intermediate transfer belt sensors

Name	Description
1	Intermediate transfer belt (end of life lever)
2	Intermediate transfer belt (home position sensor) (PS5)

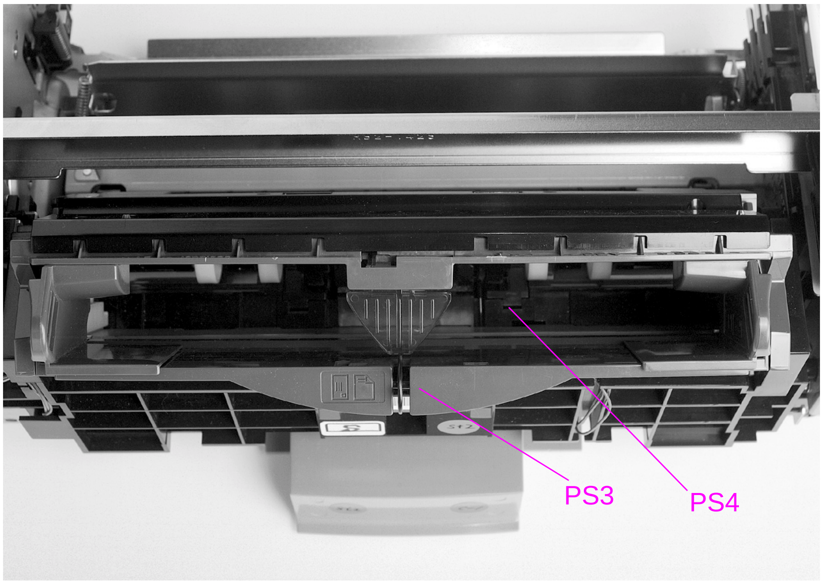


Figure 7-27 Miscellaneous sensors (with tray 1 front cover removed)

Table 7-37 PS3 and PS4 description

Name	Description
PS3	Tray 1 last page sensor
PS4	Tray 1 paper sensor

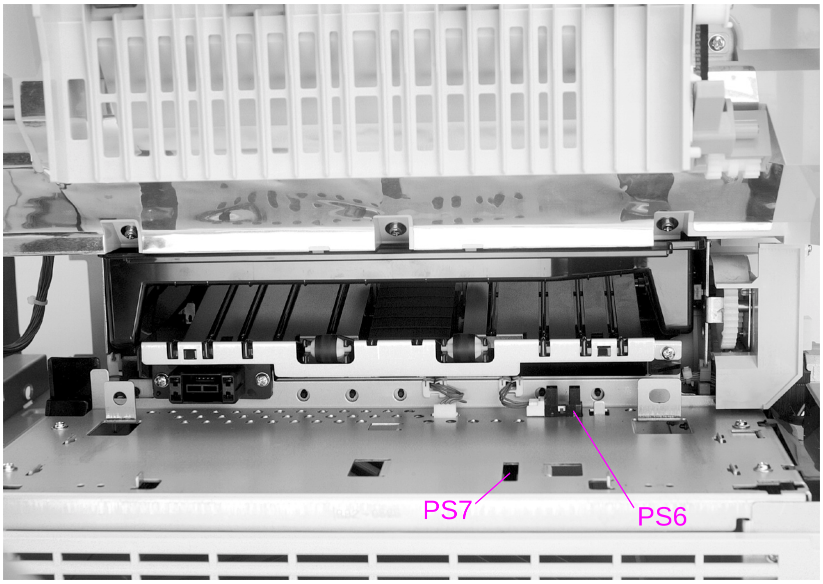


Figure 7-28 PS6 and PS7 sensor location

Table 7-38 PS6 and PS7 description

Name	Description
PS6	Fusing assembly pressure sensor
PS7	Paper exit sensor (access through the opening)

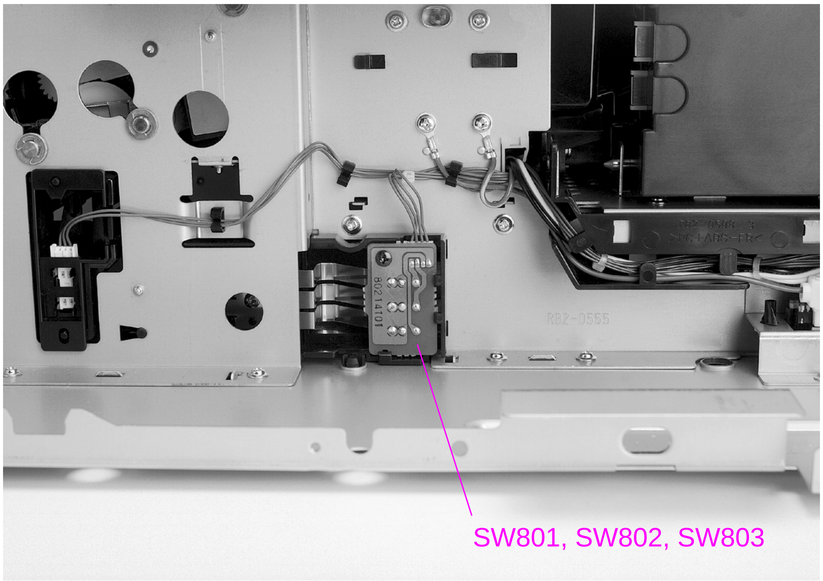


Figure 7-29 Miscellaneous switches

Table 7-39 Switch description

Name	Description
SW801, SW802, SW803	Paper tray size switches (power supply and high-voltage power supplies removed)

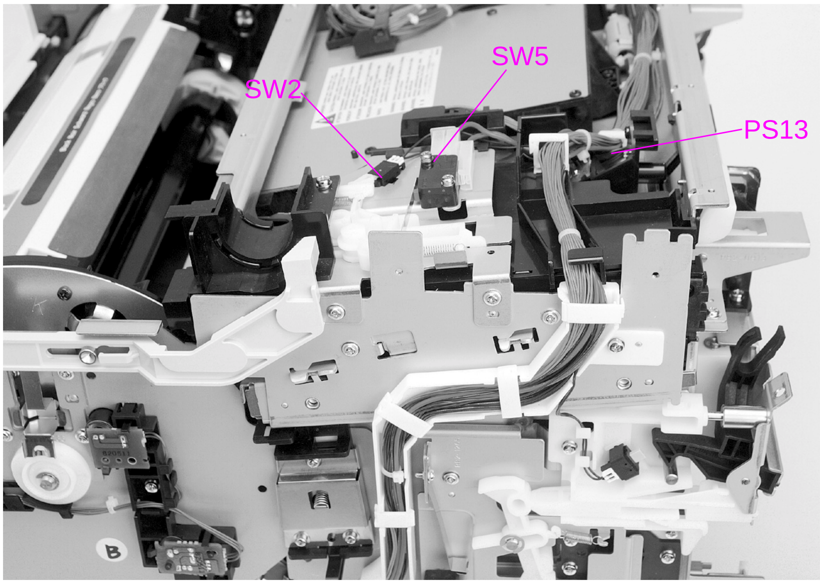


Figure 7-30 Miscellaneous switches and sensors

Table 7-40 SW2, SW5, and PS13 description

Name	Description
SW2	Top cover (toner door) switch
SW5	Top cover/rear door +24V interrupt switch
PS13	Waste toner full sensor

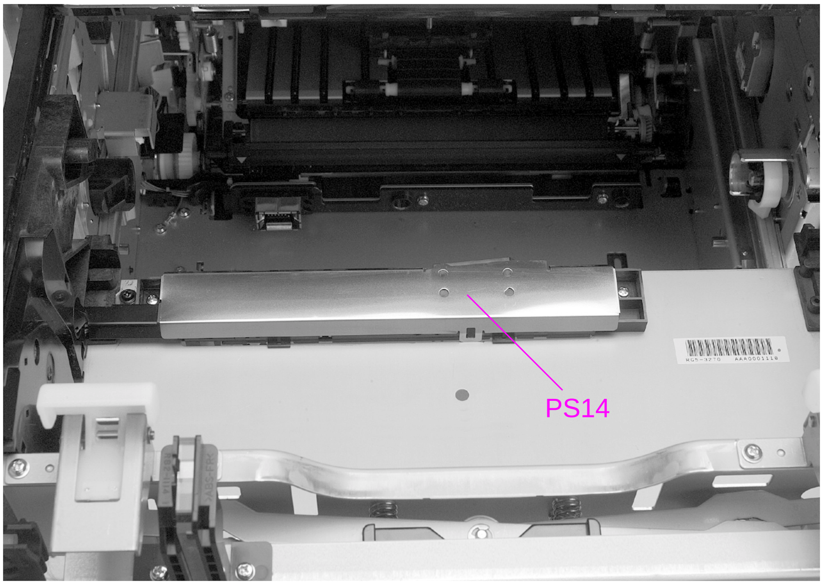


Figure 7-31 PS14 sensor location

Table 7-41 Density sensor location

Name	Description
PS14	Density sensor

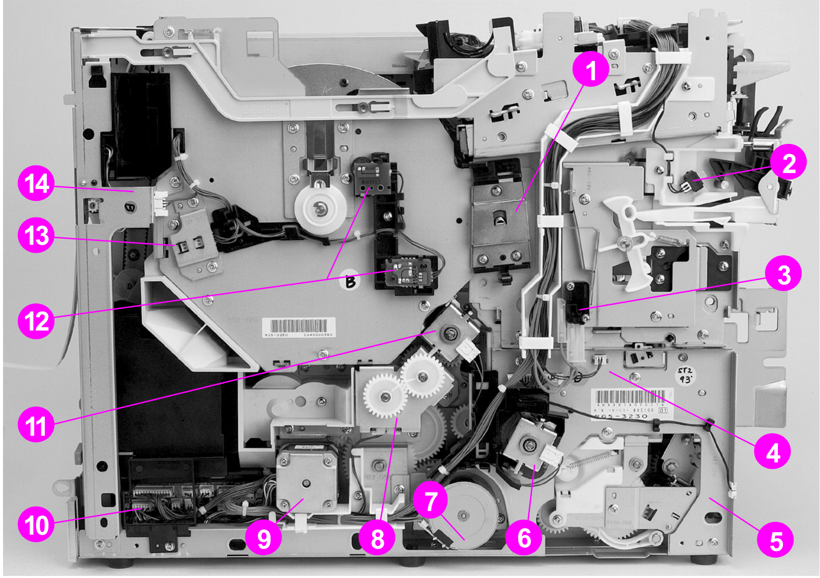


Figure 7-32 Miscellaneous parts

Table 7-42 Miscellaneous parts

Location	Name
1	Drum ground connector
2	Drum drawer closed switch (SW3)
3	Front drawers drum/ITB +24V interrupt switch (SW4)
4	ITB drawer closed switch (inside chassis wall) (SW1)

Table 7-42 Miscellaneous parts

Location	Name
5	Tray 2 pickup solenoid (behind chassis wall) (SL2)
6	Secondary transfer roller clutch (CL4)
7	Pickup motor (M2)
8	ITB contact/separation clutch (behind lower gear) (CL2)
9	Fusing motor (M1)
10	Paper feed PCB
11	Cleaning roller cam clutch (CL3)
12	Toner level sensor (emitter receiver) (PS12)
13	Carousel “home position” sensor (PS10)
14	Rear left (small) cooling fan connector

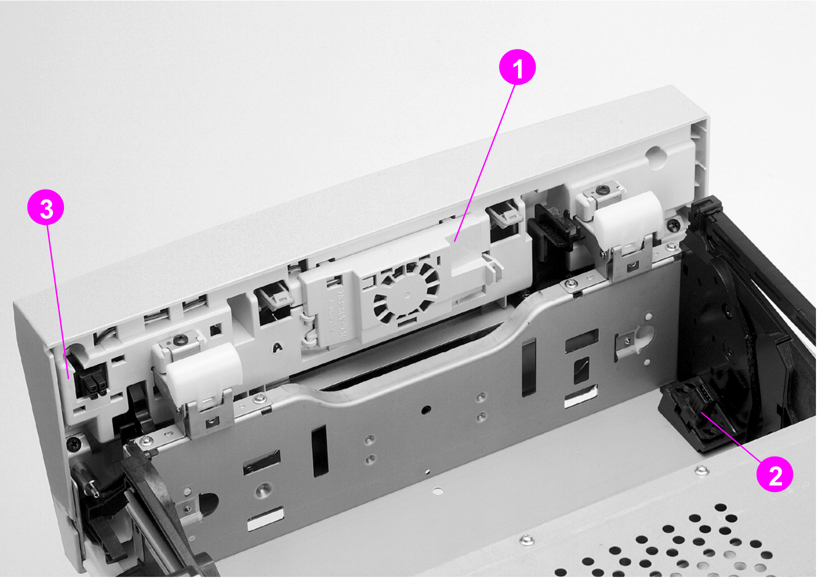


Figure 7-33 Imaging drum connector

Table 7-43 Imaging drum connector

Location	Name
1	Fan (FM3)
2	Imaging drum connector
3	FM3 cooling fan connector (drawer to chassis)

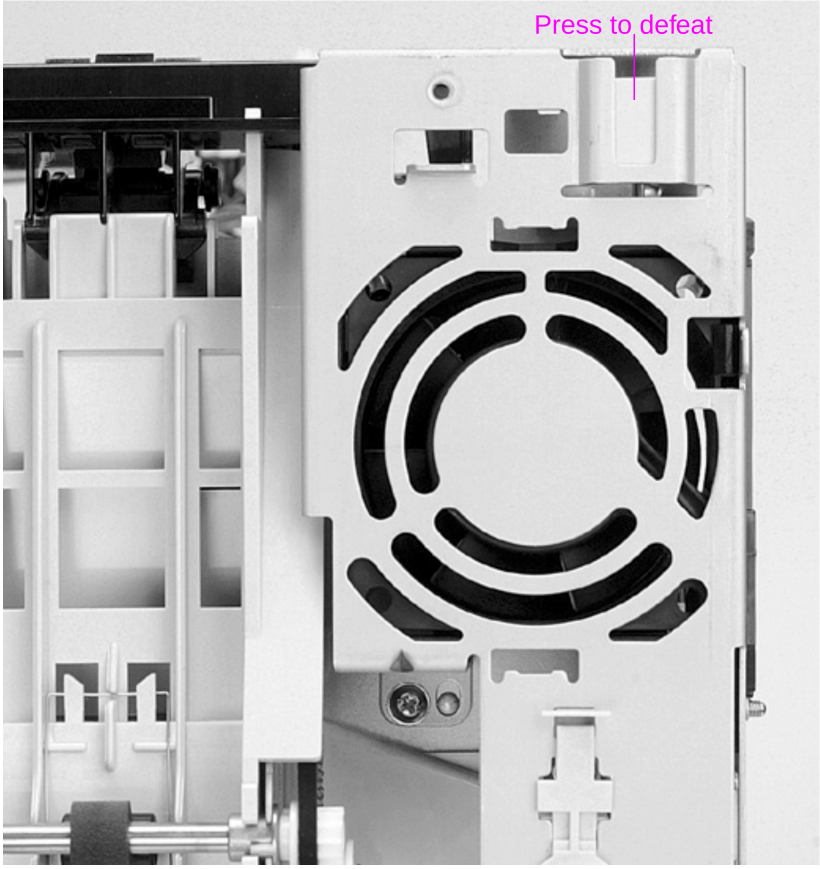

Press to defeat

Figure 7-34 Rear door interlock switch defeat

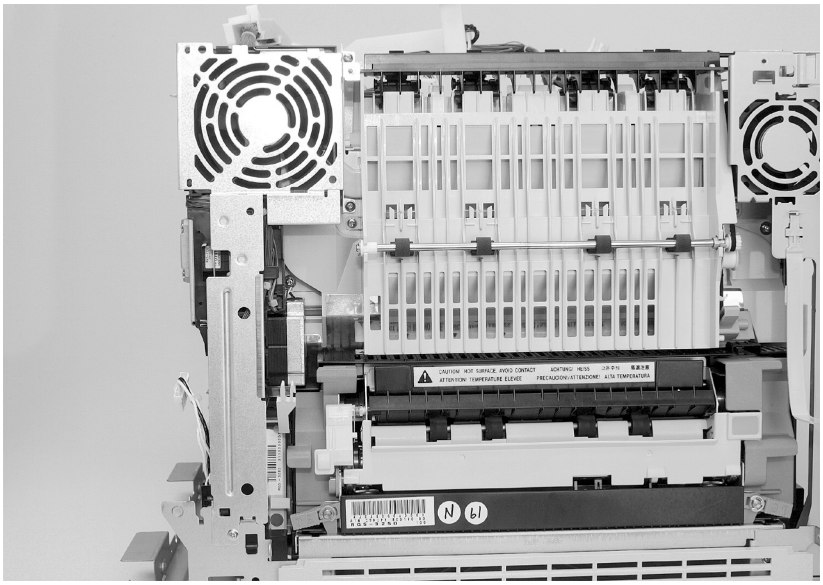


Figure 7-35 Right rear fan

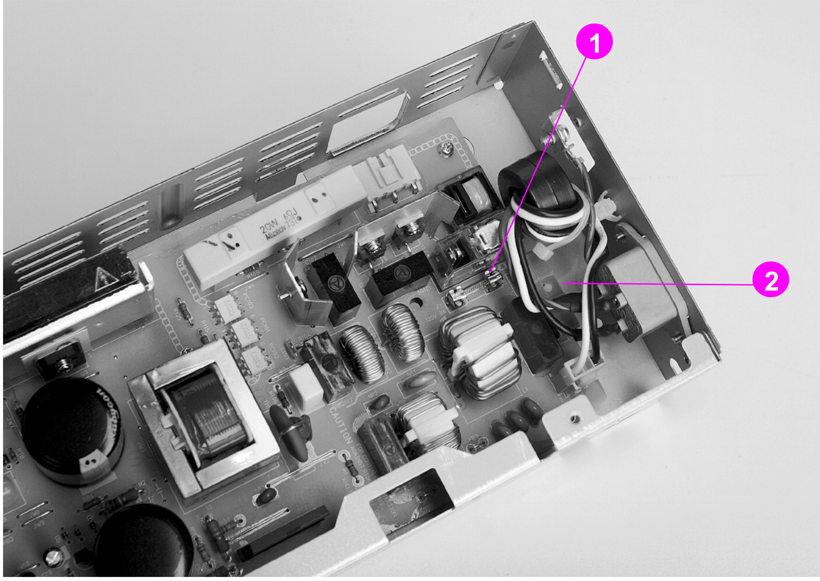


Figure 7-36 Fuse (F1) and CB101

Table 7-44 Fuse F1 and CB101 location

Location	Description
1	Fuse F1
2	Circuit breaker CB101

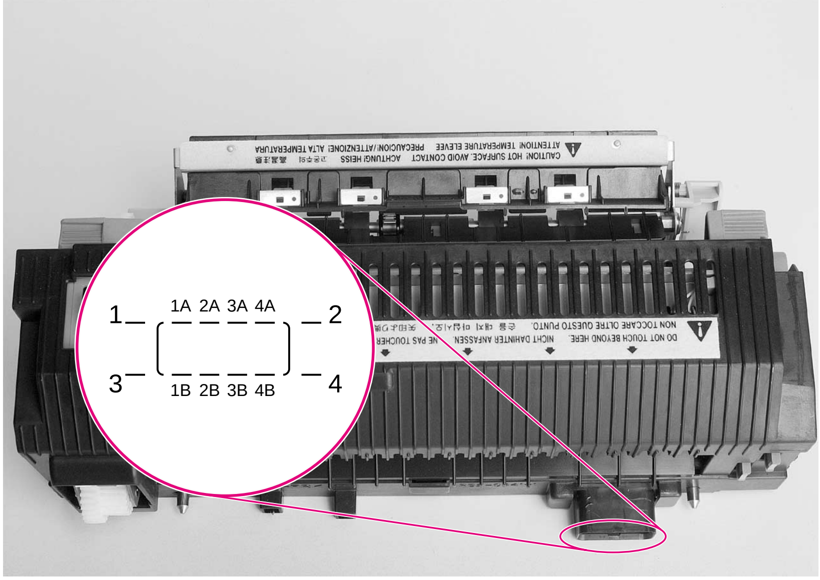


Figure 7-37 Fusing assembly

Table 7-45 110-volt fusing assembly

Location	Description
Pin 1	Frame ground
Pins 2 to 4	6.3 ohms ± 1 ohm

Table 7-45 110-volt fusing assembly

Location	Description
Pins 3 to 2	3.1 ohms ± 1 ohm
Pins 4 to 3	3.1 ohms ± 1 ohm
1A to 2A	310 K to 430 K ohm at (room temperature)
1B to 2B	310 K to 430 K ohm at (room temperature)
3B to 4B	Short 110-volt unit

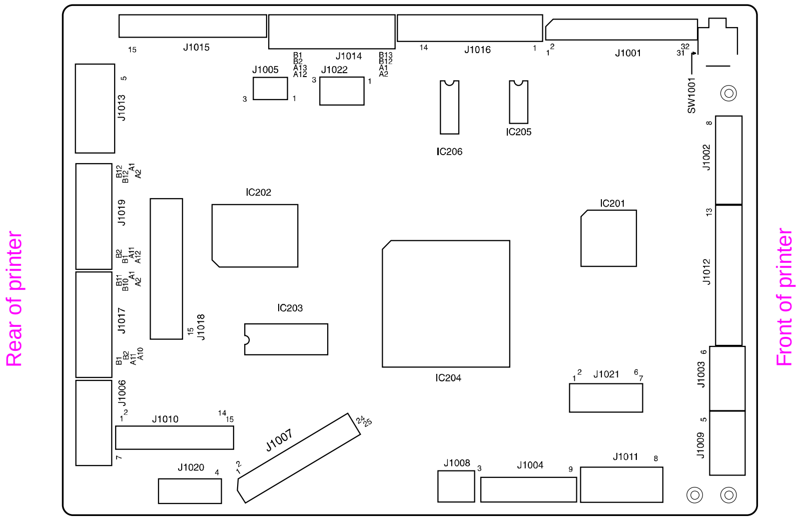
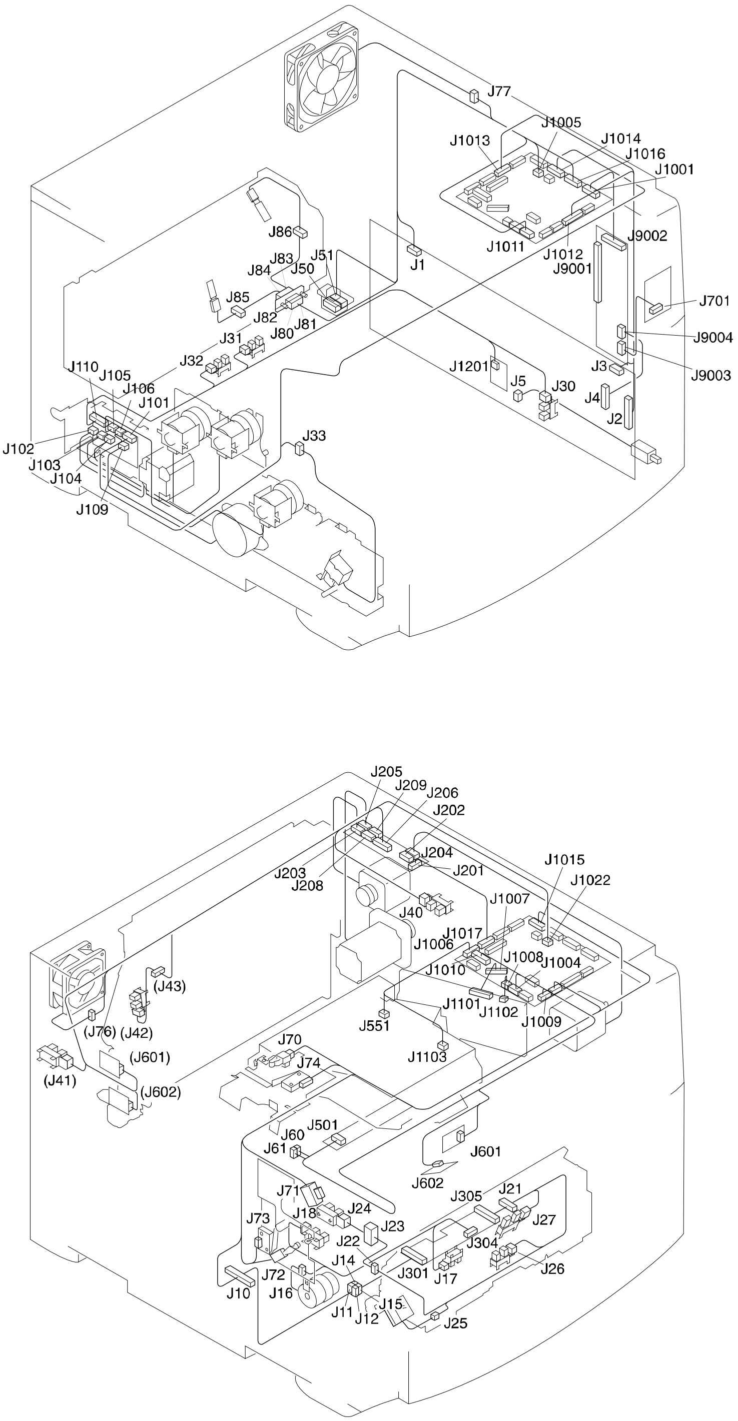
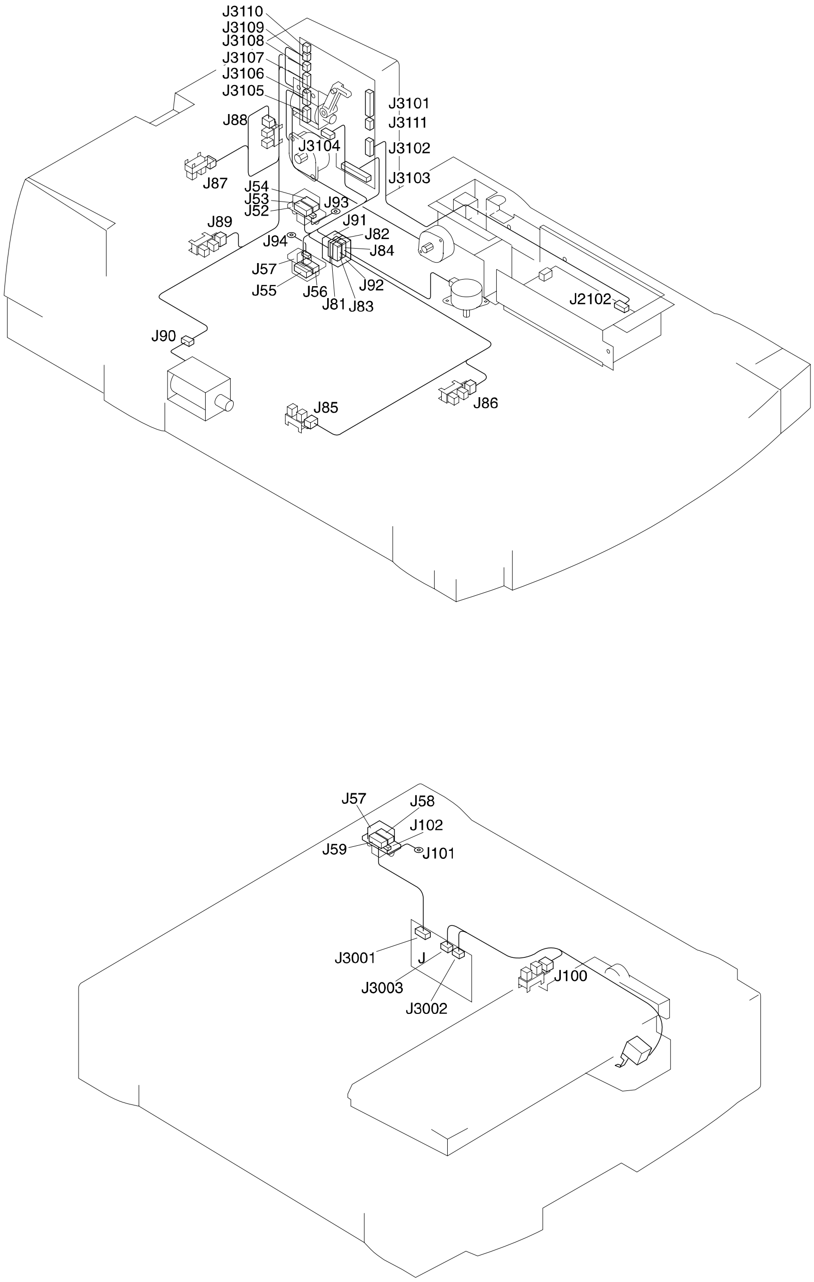

Rear of printer
Front of printer
J1015
J1014
J1016
J1001
J1005
J1022
SW1001
J1013
IC206
IC205
J1002
J1019
IC202
IC201
J1012
J1017
J1018
IC203
IC204
J1003
J1021
J1006
J1010
J1007
J1009
J1020
J1008
J1004
J1011

Figure 7-38 DC controller PCB connectors


J77
J1005
J1013
J1014
J1016
J1001
J86
J9002
J1011
J1012
J9001
J84
J83
J50
J51
J1
J85
J701
J82
J81
J80
J31
J9004
J32
J1201
J3
J9003
J110
J105
J5
J30
J106
J4
J101
J2
J33
J102
J103
J104
J109
J205
J209
J206
J202
J204
J1015
J203
J208
J201
J1022
J1007
J40
J1017
J1006
J1008
J1004
J1010
(J43)
J1101
J1102
J551
J1009
(J76)
(J42)
J70
J1103
(J601)
J74
(J41)
(J602)
J501
J60
J61
J601
J602
J71
J305
J21
J24
J18
J73
J23
J27
J22
J304
J14
J301
J17
J26
J72
J10
J16
J15
J11
J12
J25

Note: Some locations will vary slightly depending on the version of the printer.

Figure 7-39 **Location of connectors**


J3110
J3109
J3108
J3107
J3106
J3105
J88
J3101
J3111
J3104
J3102
J87
J3103
J54
J53
J52
J93
J89
J91
J94
J82
J84
J57
J55
J56
J92
J81
J83
J2102
J90
J85
J86
J57
J58
J102
J59
J101
J3001
J
J3003
J3002
J100

Note: Some locations will vary slightly depending on the version of the printer.

Figure 7-40 **Location of duplexer and 500-sheet paper feeder connectors**

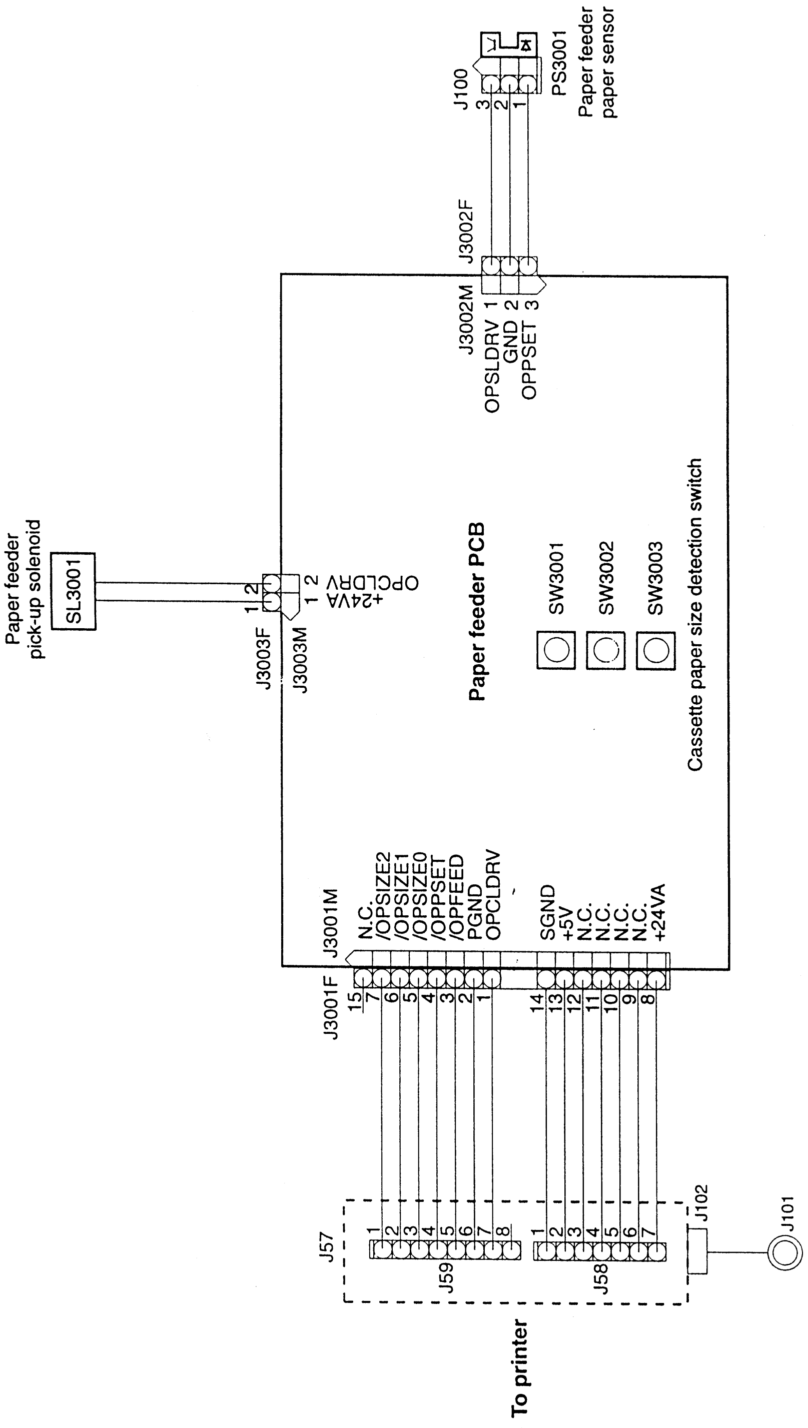

Paper feeder
paper sensor
PS3001
J100
3
2
1
J3002F
J3002M
OPSLDRV 1
GND 2
OPPSET 3
Paper feeder
pick-up solenoid
SL3001
1 2
J3003F
J3003M
1 +24VA
2 OPCLDRV
Paper feeder PCB
SW3001
SW3002
SW3003
Cassette paper size detection switch
J3001M
J3001F
15 N.C.
7 /OPSIZE2
6 /OPSIZE1
5 /OPSIZE0
4 /OPPSET
3 /OPFEED
2 PGND
1 OPCLDRV
14 SGND
13 +5V
12 N.C.
11 N.C.
10 N.C.
9 N.C.
8 +24VA
J57
J59
1 2 3 4 5 6 7 8
J58
1 2 3 4 5 6 7
J102
J101
To printer

Figure 7-41 500-sheet feeder wiring diagram

8 Parts and diagrams

Chapter contents

Introduction 324
Ordering parts 325
    Consumables, accessories, and supplies 325
    Common fasteners 328
Illustrations and parts lists 329
Alphabetical parts list 355
Numerical parts list 359

Introduction

The figures in this chapter show the major subassemblies in the printer and their component parts. A table (materials list) follows each exploded assembly diagram. Each table lists the reference designator (item number), the associated part number, quantity, and description of each part.

Note When looking for a part number, pay careful attention to the voltage listed in the description column to ensure that the part number selected is for the correct printer model.

Ordering parts

All standard part numbers are stocked and can be ordered from Commercial Support Services Organization-Americas (CSSO-A) or Commercial Support Services Organization-Europe (CSSO-E). For information about contacting CSSO-A or CSSO-E, see page 41.

Note Parts that have no reference designator or part number are not field replaceable and cannot be ordered.

Consumables, accessories, and supplies

The items listed in Table 8-1 are available through your local authorized HP dealer. To find a dealer near you (or if your local dealer is temporarily out of stock), call the HP Customer Information Center at (800) 752-0900.

Note See page 327 for documentation part numbers.

Consumable parts and accessories are available directly from Hewlett-Packard at the following numbers:

- U.S.: (800) 538-8787
- Canada: (800) 387-3154, (Toronto) (416) 671-8383
- United Kingdom: 0734-441212

Contact your local HP Parts Coordinator for other local phone numbers.

Table 8-1 Consumables, accessories, and supplies

Product number	Part number	Description
Cables		
C2946A		3 m (9 ft) parallel cable (IEEE-1284 compliant) with a 25-pin DB male to a (IEEE-1284C) male “C” connector
92215N		LocalTalk cable kit
92215S		DIN-8 printer cable (for Macintosh computers)
Consumable items		
C4195A	R94-4001-410CN	Drum kit
C4196A	R96-5009-000CN	Transfer kit
C4197A	R96-5007-000CN	Fuser kit (110V)
C4198A	R96-5008-000CN	Fuser kit (220V)
	5090-3379	Toner cloths
Localized font DIMMS		
	5062-4667	Greek (1 MB)
	5062-4668	Hebrew (1 MB)
	5062-4669	Cyrillic (1 MB)
	5062-4670	Arabic (1 MB)
C4292A (CAS)		Traditional Chinese (8 MB)
C4293A (CAS)		Simplified Chinese (8 MB)
YS-90210		Japanese (8 MB)

Table 8-1 Consumables, accessories, and supplies (continued)

Product number	Part number	Description
Media		
C2934A		HP Color LaserJet Transparencies (letter)
C2936A		HP Color LaserJet Transparencies (A4)
C4179A		HP Color LaserJet Soft Gloss Paper (letter)
C4179B		HP Color LaserJet Soft Gloss Paper (A4)
100-pin Memory (DIMMS)		
C4140A	C4140-67901	4 MB (HP Color LaserJet 4500)
C4141A	C4041-67901	8 MB (HP Color LaserJet 4500)
C4142A	C4042-67901	16 MB (HP Color LaserJet 4500)
C4143A	C4043-67901	32 MB (HP Color LaserJet 4500)
C3913A	C3913-67901	64 MB (HP Color LaserJet 4500)
168-pin Memory (DIMMS)		
C7848A	C7848-60001	64 MB (HP Color LaserJet 4550)
C7850A	C7850-60001	128 MB (HP Color LaserJet 4550)
Network Connectivity		
J3110A	J3110-69001	HP JetDirect 600N for ethernet (10Base-T [RJ-45])
J3111A	J3111-69001	HP JetDirect 600N for ethernet (10Base-T [RJ-45] and 10Base-2 [BNC]) and LocalTalk (DIN-8)
J3112A	J3112-69001	HP JetDirect 600N for Token Ring (DB9, RJ-45)
J3113A	J3113-69001	HP JetDirect 600N for Fast Ethernet (10/100 Base-TX [RJ-45])
J4169A	J4169-69001	HP JetDirect 610N for Fast Ethernet (10/100 Base-TX [RJ-45])
Options		
C4082A	C4082-67901	500-sheet input tray
C4083A	C4083-67901	Duplex unit (two-sided printing)
C4235A		HP Color LaserJet 4500 cabinet
J6054A		5 GB Hard Disk (4550 series only)
C4103A		Fast Infrared Pod (4550 series only)
C4286A		Flash firmware DIMM (4550 series only)
Panel overlays		
	C4084-40001	English
	C4084-40005	German
	C4084-40003	French
	C4084-40006	Spanish
	C4084-40004	Italian
	C4084-40015	Korean
	C4084-40018	Simplified Chinese
	C4084-40014	Traditional Chinese

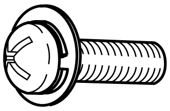
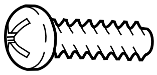
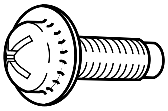
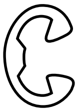
Table 8-1 Consumables, accessories, and supplies (continued)

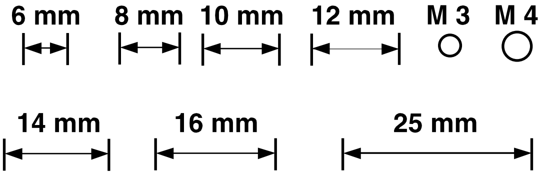
Product number	Part number	Description
	C4084-40011	Swedish
	C4084-40007	Dutch
	C4084-40009	Finnish
	C4084-40016	Russian
	C4084-40008	Danish
	C4084-40010	Norwegian
	C4084-40012	Portuguese
	C4084-40017	Czech
	C4084-40013	Polish
	C4084-40020	Japanese
Reference Materials		
	5963-7863	HP LaserJet Printer Family Print Media Guide
	5961-0976	HP PCL/PJL Reference Set
	5969-6818	HP JetDirect Print Server Administrator's Guide
	5969-3412	HP JetDirect Print Server JetAdmin Setup Guide
Toner supplies		
C4191A	R94-4005-410CN	Black
C4192A	R94-4004-410CN	Cyan
C4193A	R94-4003-410CN	Magenta
C4194A	R94-4002-410CN	Yellow
C4191A	R94-4005-510CN	Black (Europe only)
C4192A	R94-4004-510CN	Cyan (Europe only)
C4193A	R94-4003-510CN	Magenta (Europe only)
C4194A	R94-4002-510CN	Yellow (Europe only)

Note The only difference between the toner cartridges listed above is that the Europe-only toner cartridges have different languages on the instruction sheet inside the box.

Common fasteners

Table 8-2 Types of screws

Illustration	Description	Size	Uses
	Screw, machine w/washer	M3X6 M3X10 M3X12 M3X14	To hold plastic to metal, (ex. the skins)
	Screw, self tapping	M4X8 M4X10	To hold plastic to plastic, (ex. control panel)
	Screw, trus head	M3X4 M3X6 M3X8	Sheet metal to sheet metal, (ex. formatter pan)
	Retaining Ring (e-type)		To hold gears into place



Illustrations and parts lists

The following illustrations and parts tables list the field replaceable units (FRU) for this printer. At the end of this chapter are two tables of all of the parts shown in this chapter: Table 8-18 lists the parts in alphabetical order, and table 8-19 lists the parts in numerical order by part number. Both tables list the appropriate figure in this chapter where the part can be found.

Determining the printer version

Two versions of the HP Color LaserJet 4500 series printer are available. To accurately perform removal and replacement procedures or determine the correct part for reordering, you will need to know the version of the printer that is being serviced. To identify the printer, check the serial number, which is located at the rear of the printer. All printers will have US or JP in the first two positions of the serial number (e.g., **US**BB123456). Newer versions of the HP Color LaserJet 4500 printer will have an “H” or higher letter in the third position (e.g., US**H**B123456). If the letter in the third position in the serial number is “B”, “C”,”D”, or “F”, then you have an older version of the HP Color LaserJet 4500 printer. The HP Color LaserJet 4550 series printer is equivalent to the newer version of the HP Color LaserJet 4500 series printer, unless otherwise noted, although it does have some different service parts from the 4500 series.

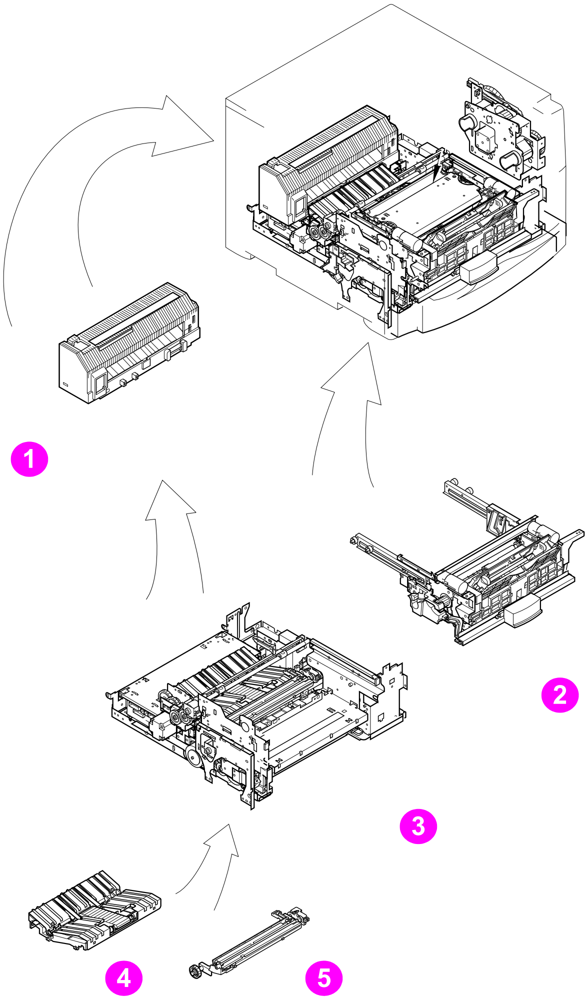


Figure 8-1 **Assembly location diagram (1 of 2)**

1	Fuser assembly
2	Intermediate Transfer Belt assembly
3	Paper path and trans port
4	Feeder assembly
5	Transfer assembly

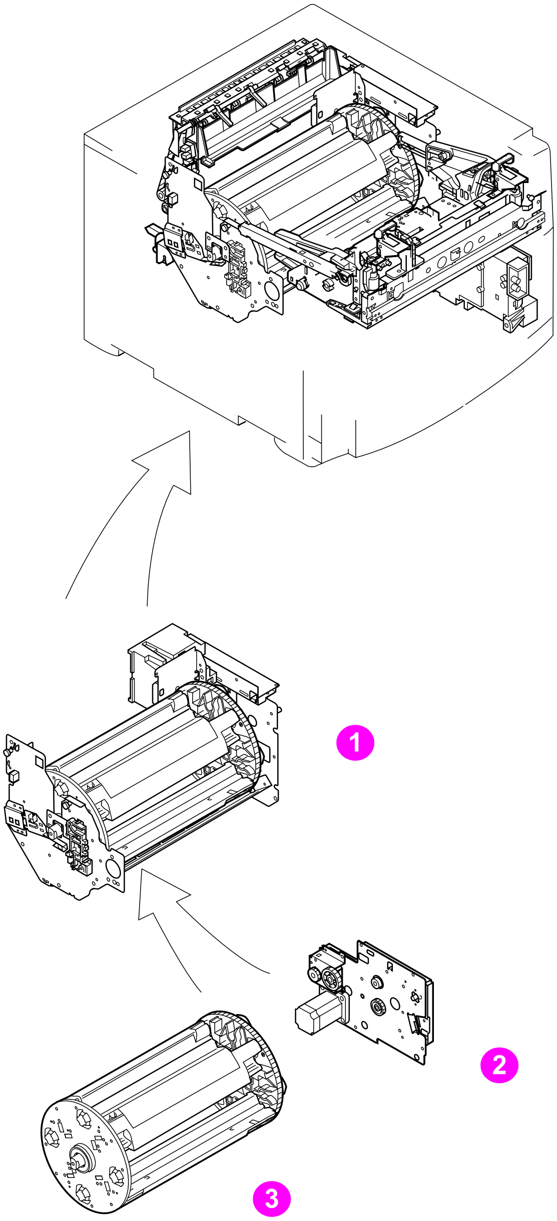


Figure 8-2 **Assembly location diagram (2 of 2)**

1 Cartridge carousel and housing assembly

2 Carousel drive assembly

3 Toner cartridge carousel assembly

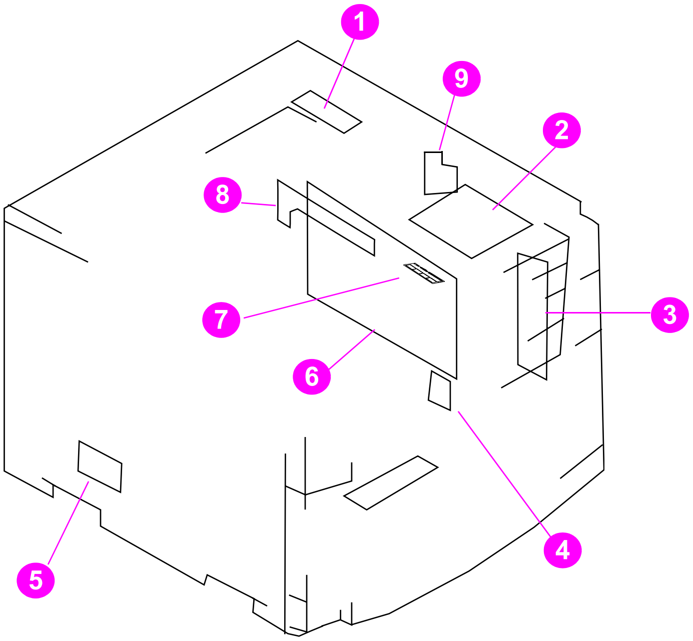


Figure 8-3 **PCB locations**

Table 8-3 PCB assembly

Ref.	Description	Qty.	Parts for 4500 series s/n xx*G*... and below	Parts for 4500 series s/n xx*H*... and above	Parts for HP Color LaserJet 4550
1	Developing PCB	1	RG5-3811-000CN	RG5-5180-000CN	RG5-5180-000CN
2	DC controller PCB	1	RG5-3809-000CN	RG5-5254-000CN	RG5-5254-000CN
3	Interconnect PCB	1	RG5-3808-000CN	RG5-3808-000CN	RG5-3808-000CN
4	Paper size sensor PCB	1	RG5-3816-000CN	RG5-3816-000CN	RG5-3816-000CN
5	Paper feed PCB assembly	1	RG5-3810-000CN	RG5-3810-000CN	RG5-3810-000CN
6	Formatter PCB	1	C4084-69001*	C4084-69001*	C4227-69001*
7	Firmware DIMM	1	C4084-60004	C4084-60004	C9130-60001
8	I/O card	1	C4081-60001	C4081-60001	C4207-60001
9	Toner level sensor PCB	1	N/A	N/A	RG5-5247-000CN

*These parts require exchange

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

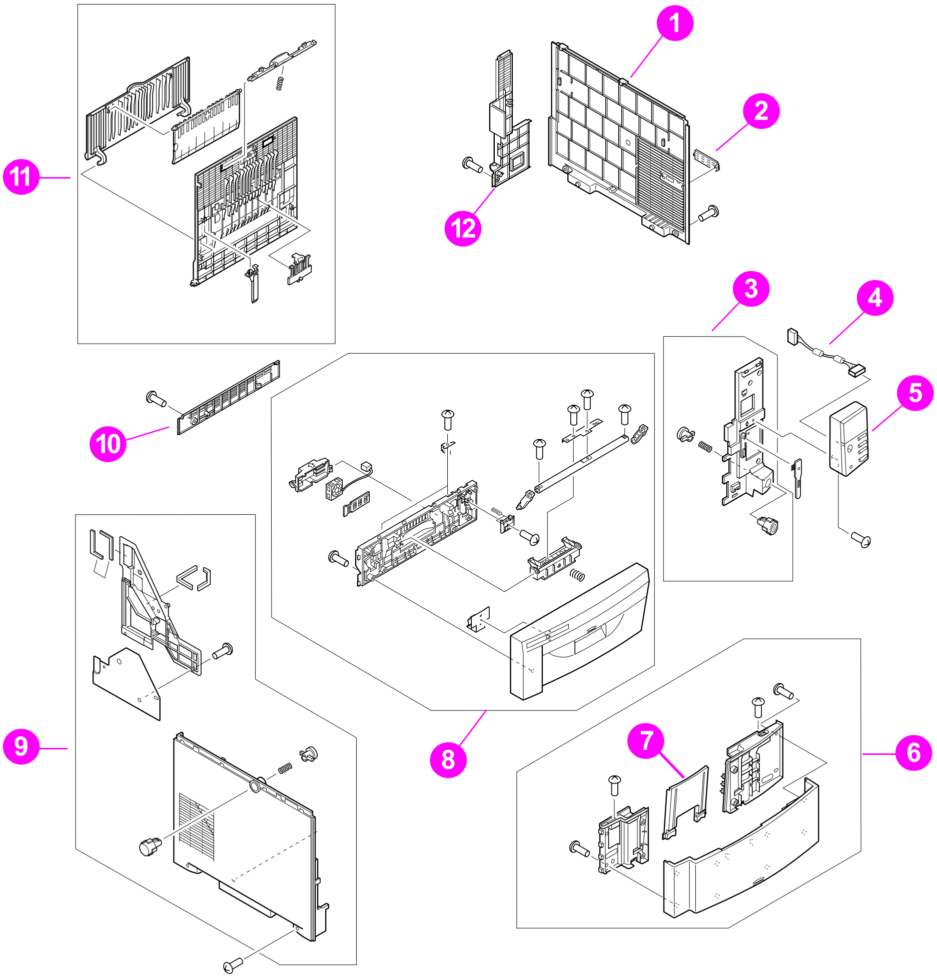

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Figure 8-4 External covers, panels, etc.

Table 8-4 Printer cover and door

Ref.	Description	Qty.	Parts for 4500 series s/n xx*G*... and below	Parts for 4500 series s/n xx*H*... and above	Parts for 4550 series
1	Cover, right side	1	RB2-1203-000CN	RB2-1203-000CN	RB2-1203-000CN
2	Cover, connector	1	RB2-1224-000CN	RB2-1224-000CN	RB2-1224-000CN
3	Cover, right front	1	RG5-3310-000CN	RG5-3310-000CN	RG5-3310-000CN
4	Cable, control panel	1	RG5-3802-000CN	RG5-5195-000CN	RG5-5195-000CN
5	Control panel assembly	1	RG5-5200-000CN	RG5-5200-000CN	RG5-5200-000CN
6	Cover, ITB drawer	1	RG5-3320-000CN	RG5-3320-000CN	RG5-3320-000CN
7	Tray, extension	1	RB2-1215-000CN	RB2-1215-000CN	RB2-1215-000CN
8	Cover, drum drawer	1	RG5-5232-000CN**	RG5-5152-000CN	RG5-5152-000CN
9	Cover, left side	1	RG5-3313-000CN	RG5-5151-000CN	RG5-5151-000CN
10	Cover, lower rear	1	RB2-1206-000CN	RB2-1206-000CN	RB2-1206-000CN
11	Door, rear access	1	RG5-3325-040CN	RG5-3325-040CN	RG5-3325-040CN
12	Cover, rear	1	RB2-1205-000CN	RB2-1205-000CN	RB2-1205-000CN

**Refer to note, below.

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

Note Early CLJ4500 printers (serial numbers xxGxxxxxxx and below) have two versions of the drum drawer cover and the upper (drum) drawer assembly (Figure 8-7, item 6 and Figure 8-13, item 1). If the drum drawer cover requires replacement, first determine whether you have the original version of the drum drawer by locating a bar code label with a part number of RG5-3315 on the inside of the drum drawer cover, just to the right of the fan cover. If you have the original version of the drum drawer, order kit part number **RG5-5230-000CN** to obtain the newer version of the drum drawer assembly, drum drawer cover, plus additional hardware required to complete the update. If the newer version of the drum drawer is already installed, simply order the replacement drum drawer cover (RG5-5232-000CN).

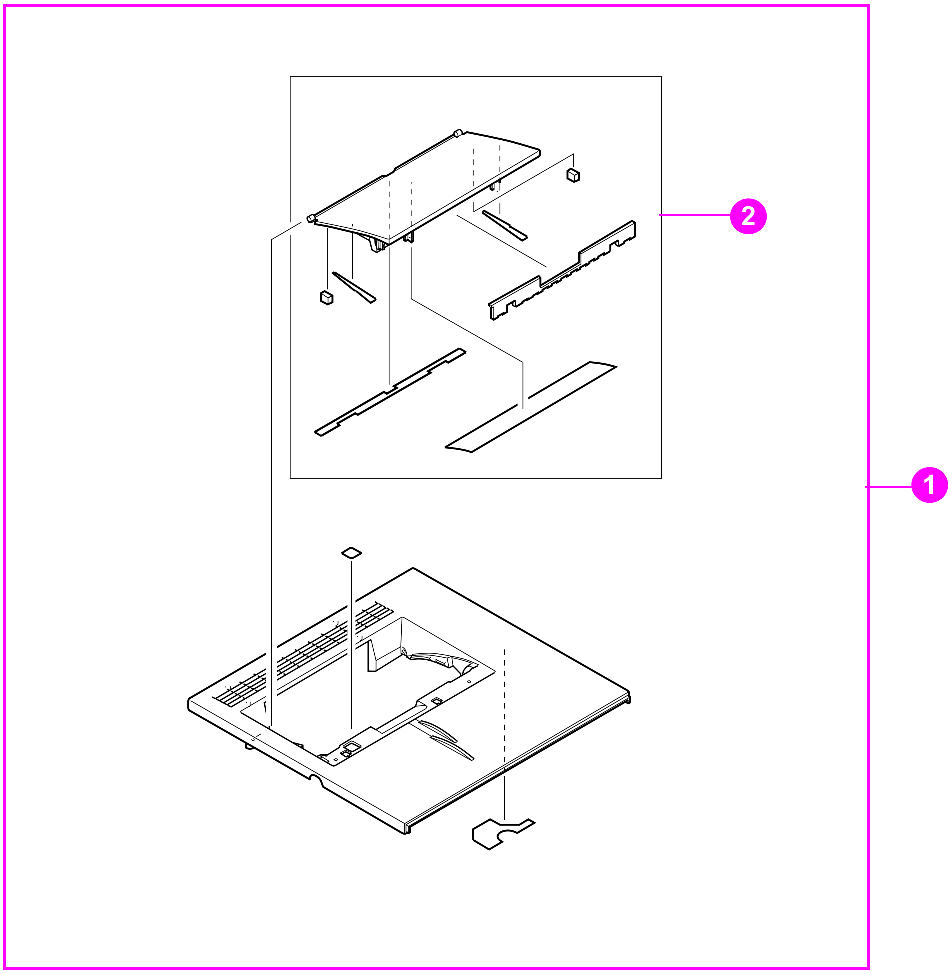

Figure 8-5 Top cover assembly

Table 8-5 Top cover components

Ref.	Description	Qty.	Parts for 4500 series s/n xx*G*... and below	Parts for 4500 series s/n xx*H*... and above	Parts for 4550 series
1	Cover, top	1	RG5-3300-000CN	RG5-5150-000CN	RG5-5150-000CN
2	Cover, toner access	1	RF5-2076-000CN	RF5-3137-000CN	RF5-3137-000CN

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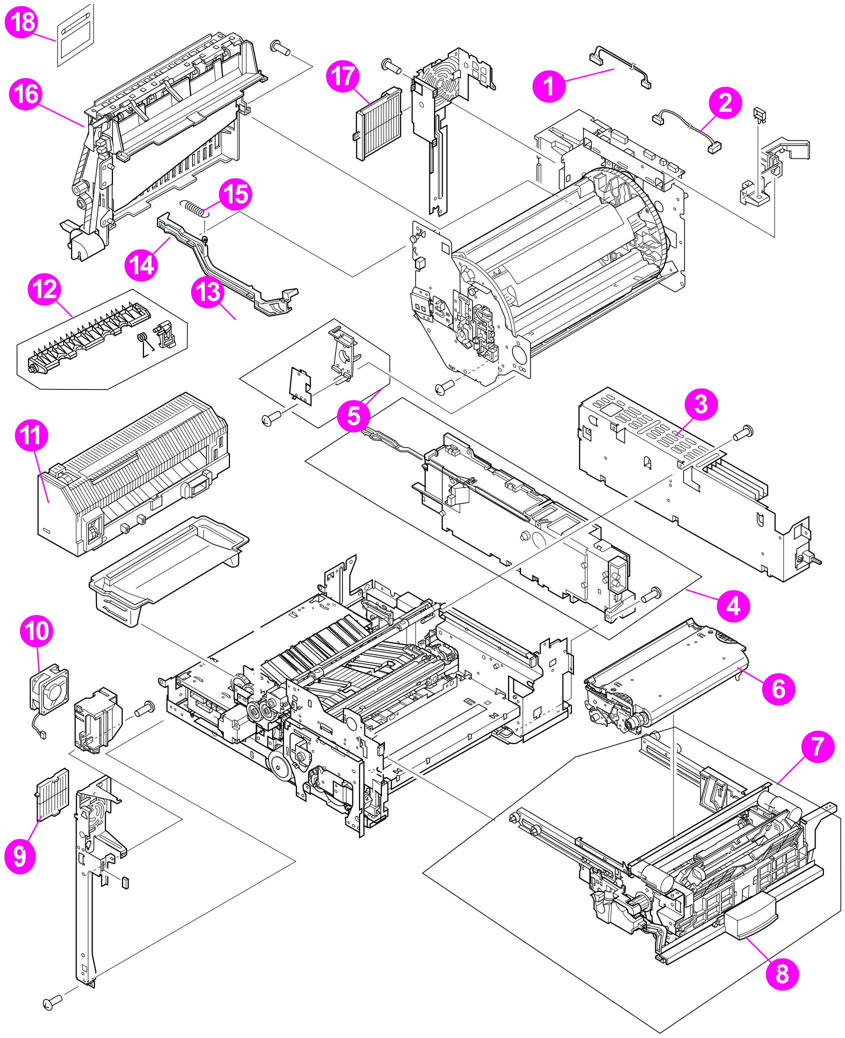

Figure 8-6 **Internal components (1 of 3)**

Table 8-6 Internal components (1 of 3)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Cable, fan	1	RG5-3887-000CN	N/A	N/A
2	Cable, developer	1	RG5-3783-000CN	RG5-5187-000CN	RG5-5187-000CN
3	Power supply, 110V	1	RH3-2219-000CN	RH3-2219-000CN	RH3-2219-000CN
3	Power supply, 220V	1	RH3-2220-000CN	RH3-2220-000CN	RH3-2220-000CN
4	High-voltage power supply	1	RG5-3285-000CN	RG5-5165-000CN	RG5-5165-000CN
5	Strap, cover support	1	RB2-1556-000CN	RB2-1556-000CN	RB2-1556-000CN
6	ITB assembly	1	RG5-5173-060CN	RG5-5173-060CN	RG5-5173-060CN
7	ITB drawer assembly	1	RG5-5120-100CN	RG5-5120-100CN	RG5-5120-100CN
8	Handle, ITB drawer	1	RB2-1361-000CN	RB2-1361-000CN	RB2-1361-000CN
9	Filter, air (small)	1	RB2-1283-000CN	RB2-1283-000CN	RB2-1283-000CN
10	Fan, small	1	RH7-1407-000CN	RH7-1407-000CN	RH7-1407-000CN
11	Fuser, 110V	1	RG5-5154-050CN C4084-69002*	RG5-5154-050CN C4084-69002*	RG5-5154-050CN C4084-69002*

Table 8-6 Internal components (1 of 3) (continued)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
11	Fuser, 220V	1	RG5-5155-050CN C4084-69003*	RG5-5155-050CN C4084-69003*	RG5-5155-050CN C4084-69003*
12	Kit, Fuser Deflector	1	C4084-67906	C4084-67906	C4084-67906
13	Drum bushing assembly	1	RG5-5169-000CN	RG5-5169-000CN	RG5-5169-000CN
14	Rod, delivery	1	RB2-1284-000CN	RB2-1284-000CN	RB2-1284-000CN
15	Spring, tension	1	RS5-2754-000CN	RS5-2754-000CN	RS5-2754-000CN
16	Face-down delivery assembly	1	RG5-5135-000CN	RG5-5135-000CN	RG5-5135-000CN
17	Filter, air (large)	1	RB2-1282-000CN	RB2-1282-000CN	RB2-1282-000CN
18	Flapper guide assembly	1	RG5-5251-000CN	RG5-5251-000CN	RG5-5251-000CN

*These parts require exchange

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

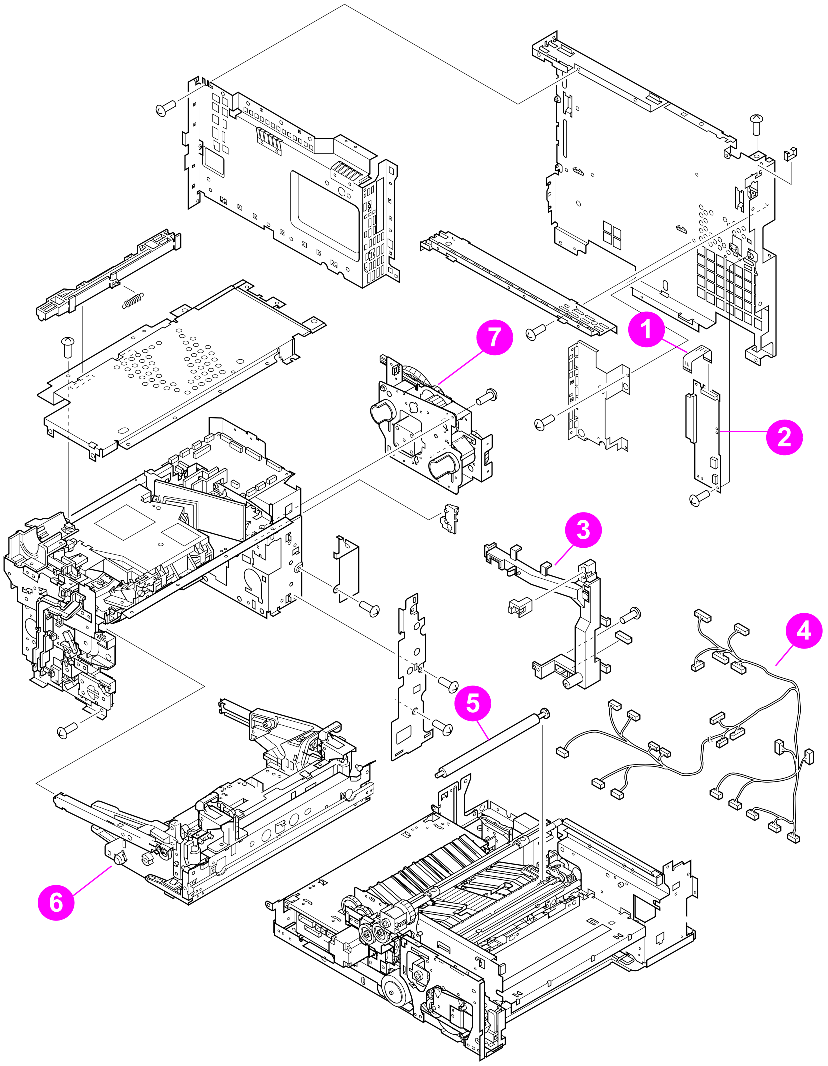

Figure 8-7 Internal components (2 of 3)

Table 8-7 Internal components (2 of 3)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Cable, video interface	1	RH2-5335-000CN	RH2-5335-000CN	RH2-5335-000CN
2	Interconnect PCB	1	RG5-3808-000CN	RG5-3808-000CN	RG5-3808-000CN
3	Guide, cable	1	RB2-1277-000CN	RB2-1277-000CN	RB2-1277-000CN
4	Cable, main	1	RG5-3781-000CN	RG5-5186-000CN	RG5-5186-000CN
5	Roller, transfer	1	RF5-2112-000CN	RF5-2112-000CN	RF5-2112-000CN
6	Drum drawer assembly	1	RG5-5230-000CN	RG5-5142-050CN	RG5-5142-050CN
7	Drum drive assembly	1	RG5-5206-000CN	RG5-5206-000CN	RG5-5206-000CN

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

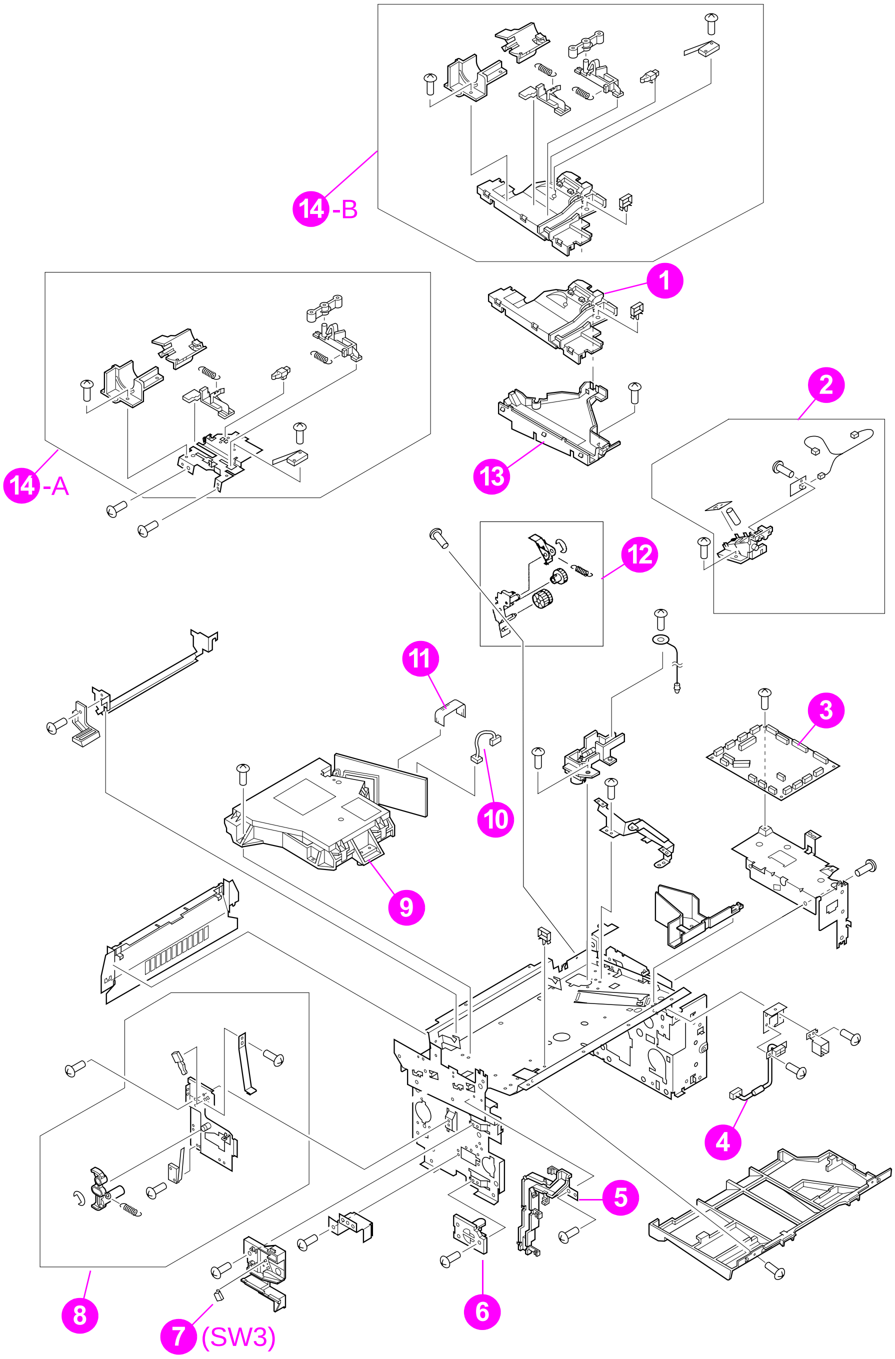
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Figure 8-8 **Internal components (3 of 3)**

Table 8-8 Internal components (3 of 3)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Guide, upper drum drawer cable	1	RB2-1457-000CN	(included in 14B)	(included in 14B)
2	Sensor, waste toner (PS13)	1	RG5-3292-000CN	RG5-3292-000CN	RG5-3292-000CN
3	DC controller PCB	1	RG5-3809-000CN	RG5-5254-000CN	RG5-5254-000CN
4	Cable, fan	1	RG5-4650-000CN	RG5-4650-000CN	RG5-4650-000CN
5	Cover, cable	1	RB2-1180-000CN	RB2-1180-000CN	RB2-1180-000CN
6	Bushing, ITB left	1	RB2-1158-000CN	RB2-5185-000CN	RB2-5185-000CN
7	Microswitch	1	WC2-5330-000CN	WC2-5330-000CN	WC2-5330-000CN
8	Drawer switch assembly	1	RG5-3296-030CN	RG5-3296-030CN	RG5-3296-030CN
9	Laser/scanner assembly	1	RG5-5175-000CN	RG5-5175-000CN	RG5-5175-000CN
10	Cable, laser	1	RG5-3782-000CN	RG5-3782-000CN	RG5-3782-000CN
11	Cable, laser (flat)	1	RH2-5400-000CN	RH2-5400-000CN	RH2-5400-000CN
12	Carousel brake assembly	1	RG5-3309-000CN	RG5-5163-000CN	RG5-5163-000CN
13	Guide, cable, lower	1	RB2-1456-000CN	RB2-1456-000CN	RB2-1456-000CN
14A/B	Door switch assembly	1	RG5-5170-000CN	RG5-5170-000CN	RG5-5170-000CN

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

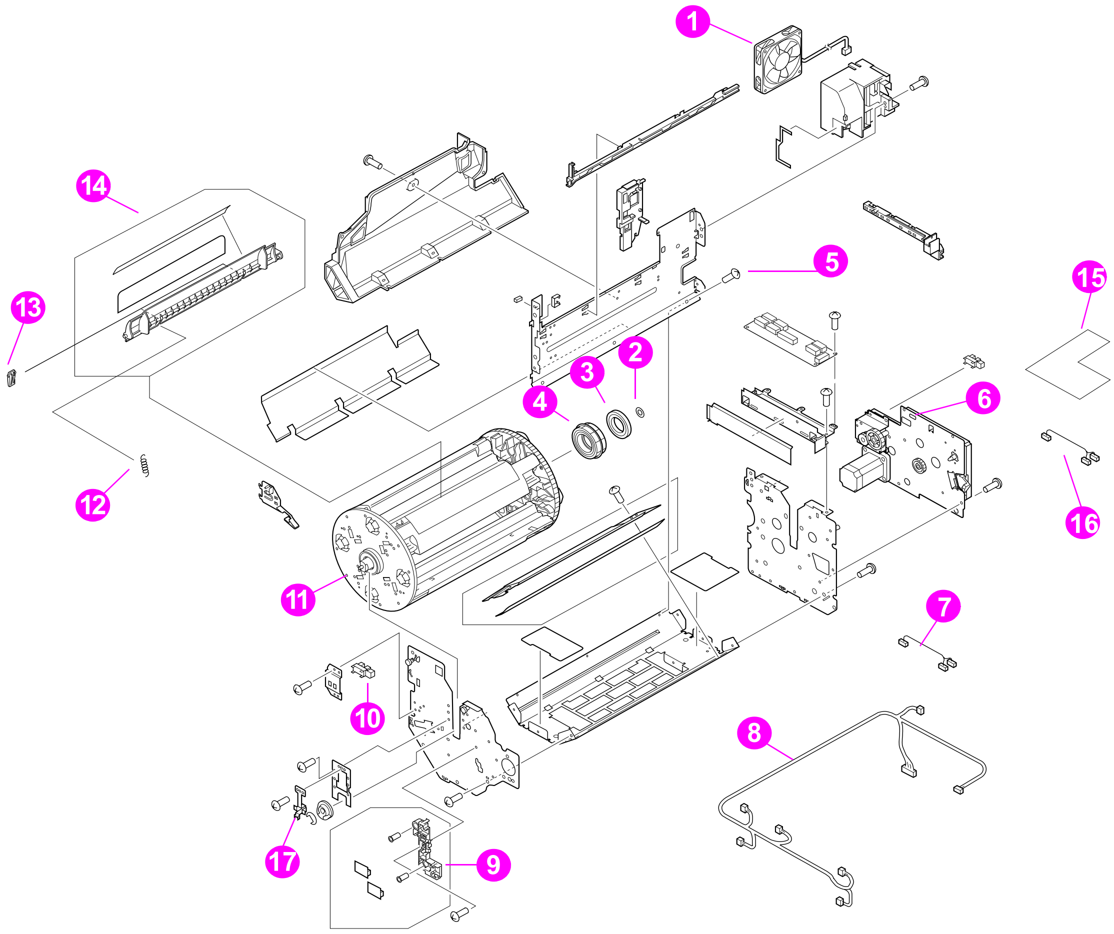
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Figure 8-9 Developing carousel assembly

Table 8-9 Developing carousel assembly

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Fan, large	1	RH7-1346-000CN	RH7-1435-000CN	RH7-1435-000CN
2	Spacer	1	RS5-6210-000CN	RS5-6210-000CN	RS5-6210-000CN
3	Bearing, carousel	1	XG9-0361-000CN	XG9-0361-000CN	XG9-0361-000CN
4	Gear, 125T	1	RS6-0176-000CN	RS6-0176-000CN	RS6-0176-000CN
5	Developing PCB	1	RG5-3811-000CN	RG5-5180-000CN	RG5-5180-000CN
6	Carousel drive assembly	1	RG5-5209-000CN	RG5-5209-000CN	RG5-5209-000CN
7	Cable, fusing connector	1	RG5-3886-000CN	RG5-3886-000CN	RG5-3886-000CN
8	Cable, rotary	1	RG5-3795-000CN	RG5-3795-000CN	RG5-3795-000CN
9	Sensor (PS12), toner level	1	RG5-3355-000CN	RG5-3355-000CN	RG5-3355-000CN
10	Sensor (PS10), carousel position	1	WG8-5362-000CN	WG8-5362-000CN	WG8-5362-000CN
11	Carousel assembly	1	RG5-5249-000CN	RG5-5249-000CN	RG5-5249-000CN
12	Spring, toner flap	2	RS5-2739-000CN	RS5-2739-000CN	RS5-2739-000CN
13	Cap, toner flap	2	RB2-0964-000CN	N/A	N/A
14	Kit, carousel flap	1	C4084-67907	C4084-67909	C4084-67909
15	Toner level sensing PCB	1	N/A	N/A	RG5-5247-000CN
16	Toner level sensing cable	1	N/A	N/A	RG5-5444-000CN
17	Grounding spring	1	RB2-0981-000CN	RB2-0981-000CN	RB2-0981-000CN

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

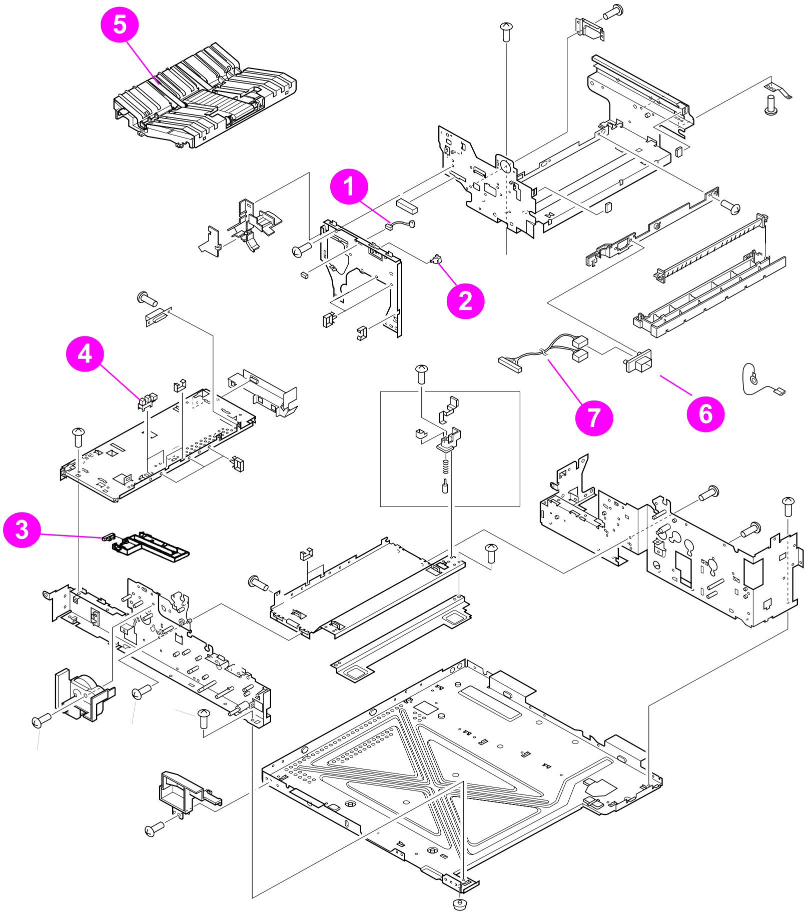

Figure 8-10 Paper pick-up assembly (1 of 3)

Table 8-10 Paper pick-up assembly (1 of 3)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Cable, ITB switch	1	RG5-4651-000CN	RG5-4651-000CN	RG5-4651-000CN
2	Microswitch, ITB	1	WC2-5330-000CN	WC2-5330-000CN	WC2-5330-000CN
3	Sensor (PS7), delivery paper		FH7-7313-000CN	FH7-7313-000CN	FH7-7313-000CN
4	Sensor (PS6), fusing unit pressure release	1	WG8-5309-000CN	WG8-5309-000CN	WG8-5309-000CN
5	Feeder assembly	1	RG5-3226-000CN	RG5-5117-000CN	RG5-5117-000CN
6	ITB drawer connector	1	VS1-6174-014CN	VS1-6174-014CN	VS1-6174-014CN
7	ITB cable	1	RG5-3786-000CN	RG5-3786-000CN	RG5-3786-000CN

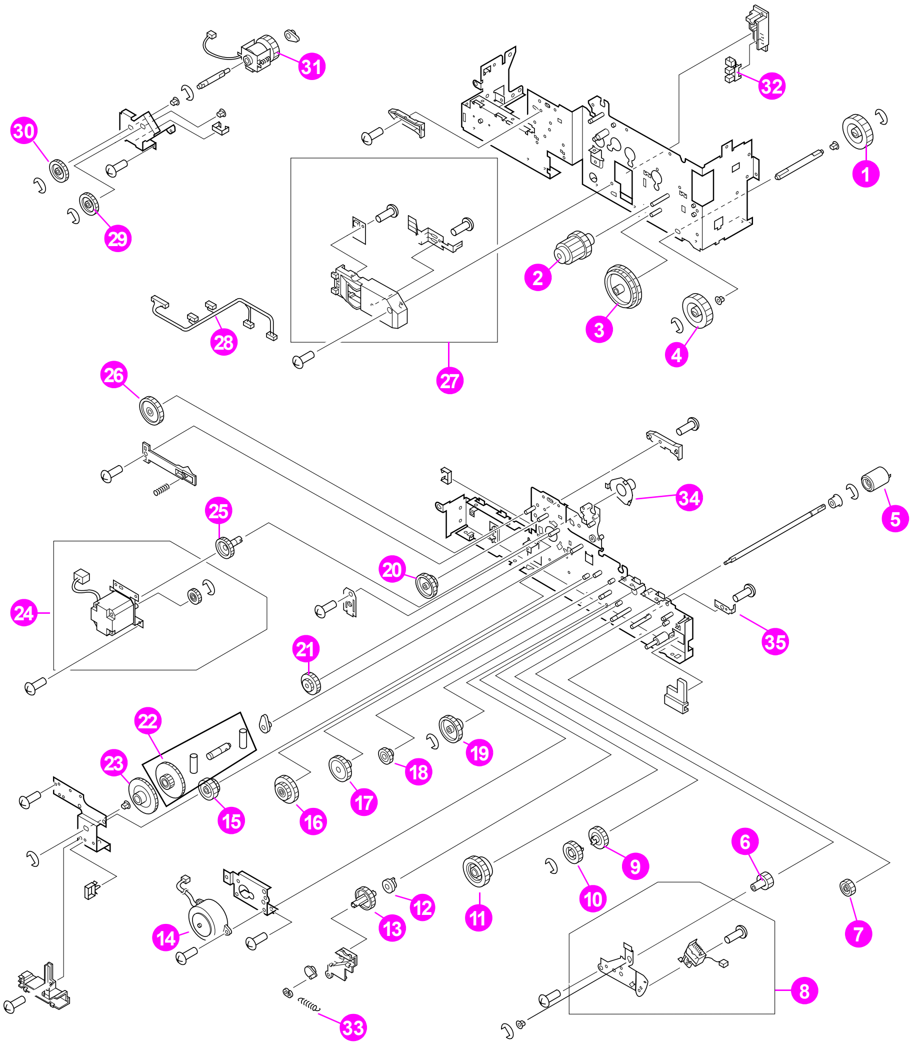

Figure 8-11 **Paper pick-up assembly (2 of 3)**

Table 8-11 Paper pick-up assembly (2 of 3)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Gear, 17T	2	RS6-0158-000CN	RS6-0158-000CN	RS6-0158-000CN
2	Gear, 18T/14T	1	RS6-0157-000CN	RS6-0157-000CN	RS6-0157-000CN
3	Gear, 53T/46T	1	RS6-0156-000CN	RS6-0156-000CN	RS6-0156-000CN
4	Gear, 17T	1	RS6-0158-000CN	RS6-0158-000CN	RS6-0158-000CN
5	Roller	1	RF5-2092-000CN	RF5-2092-000CN	RF5-2092-000CN
6	Gear, 18T	1	RS6-0140-000CN	RS6-0140-000CN	RS6-0140-000CN
7	Gear, 19T	1	RS6-0141-000CN	RS6-0141-000CN	RS6-0141-000CN
8	Solenoid, Tray 2 feed (SL2)	1	RG5-3245-000CN	RG5-5119-000CN	RG5-5119-000CN
9	Gear, 27T	1	RS6-0135-000CN	RS6-0135-000CN	RS6-0135-000CN
10	Gear, 27T	1	RS6-0135-000CN	RS6-0135-000CN	RS6-0135-000CN
11	Gear, 30T/16T	1	RS6-0134-000CN	RS6-0134-000CN	RS6-0134-000CN
12	Bushing	2	RS5-1293-000CN	RS5-1293-000CN	RS5-1293-000CN

Table 8-11 Paper pick-up assembly (2 of 3) (continued)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
13	Gear, 31T	1	RS6-0136-000CN	RS6-0136-000CN	RS6-0136-000CN
14	Motor (M2), pick-up	1	RH7-1343-000CN	RH7-1343-000CN	RH7-1343-000CN
15	Gear, 47T	1	RS6-0147-000CN	RS6-0147-000CN	RS6-0147-000CN
16	Gear, 24T/37T	1	RS6-0163-000CN	RS6-0163-000CN	RS6-0163-000CN
17	Gear, 35T	1	RS6-0132-000CN	RS6-0132-000CN	RS6-0132-000CN
18	Gear, 20T	1	RS6-0138-000CN	RS6-0138-000CN	RS6-0138-000CN
19	Gear, 37T/14T	1	RS6-0133-000CN	RS6-0133-000CN	RS6-0133-000CN
20	Gear, 34T/15T	1	RS6-0144-000CN	RS6-0144-000CN	RS6-0144-000CN
21	Gear, 29T/17T	1	RS6-0145-000CN	RS6-0145-000CN	RS6-0145-000CN
22	Gear assembly, 18T/52T	1	RF5-2161-000CN	RF5-2161-000CN	RF5-2161-000CN
23	Gear, 52T	1	RS6-0146-000CN	RS6-0146-000CN	RS6-0146-000CN
24	Motor (M1), fusing assembly	1	RG5-3227-000CN	RG5-3227-000CN	RG5-3227-000CN
25	Gear, 26T	1	RS6-0149-000CN	RS6-0149-000CN	RS6-0149-000CN
26	Gear, 37T	1	RS6-0143-000CN	RS6-0143-000CN	RS6-0143-000CN
27	Sensor, paper size	1	RG5-3234-000CN	RG5-3234-000CN	RG5-3234-000CN
28	Cable, paper feed	1	RG5-3785-000CN	RG5-3785-000CN	RG5-3785-000CN
29	Gear, 29T	1	RS6-0150-000CN	RS6-0150-000CN	RS6-0150-000CN
30	Gear, 29T	1	RS6-0150-000CN	RS6-0150-000CN	RS6-0150-000CN
31	Clutch (CL2), electromagnetic	1	RH7-5176-000CN	RH7-5176-000CN	RH7-5176-000CN
32	Sensor (PS8), cassette paper	1	WG8-5309-000CN	WG8-5309-000CN	WG8-5309-000CN
33	Spring, Tray 2 pickup tension	1	RS5-2794-000CN	RS5-2794-000CN	RS5-2794-000CN
34	Cone	1	RS5-1341-000CN	RS5-1341-000CN	RS5-1341-000CN
35	Metal tab, tray 2	1	RB2-0593-000CN	RB2-0593-000CN	RB2-0593-000CN

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

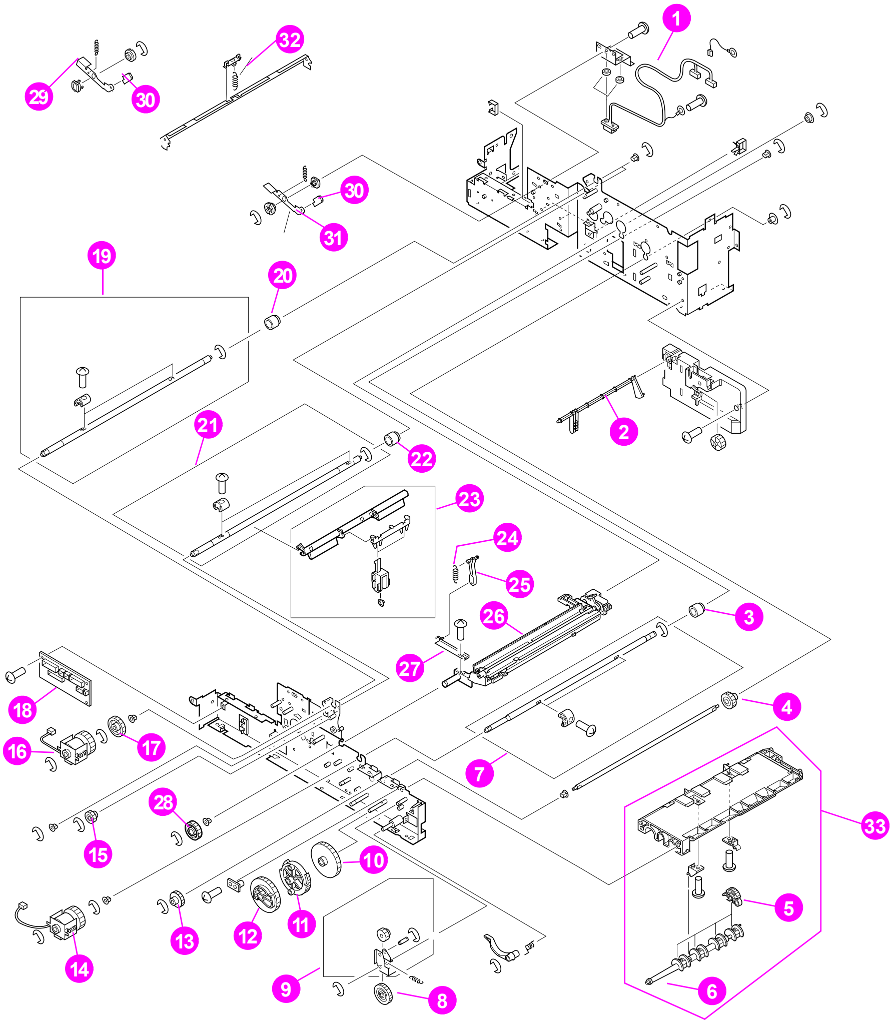

Figure 8-12 Paper pick-up assembly (3 of 3)

Table 8-12 Paper pick-up assembly (3 of 3)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Cable, fusing/option	1	RG5-3787-000CN	RG5-3787-000CN	RG5-3787-000CN
2	Lever, sensor	1	RB2-0576-000CN	RB2-0576-000CN	RB2-0576-000CN
3	Clutch, one-way	1	RB2-0572-000CN	RB2-0572-000CN	RB2-0572-000CN
4	Gear, 18T	1	RS6-0139-000CN	RS6-0139-000CN	RS6-0139-000CN
5	Roller, paper pick	4	RB1-8865-000CN	RB1-8865-000CN	RB1-8865-000CN
6	Shaft, paper pick	1	RB2-0545-000CN	RB2-0545-000CN	RB2-0545-000CN
7	Transfer cam assembly	1	RG5-3240-000CN	RG5-5118-000CN	RG5-5118-000CN
8	Gear, 26T/18T	1	RS6-0137-000CN	RS6-0137-000CN	RS6-0137-000CN
9	Gear assembly	1	RG5-3228-000CN	RG5-3228-000CN	RG5-3228-000CN
10	Gear, 53T	1	RS6-0155-000CN	RS6-0155-000CN	RS6-0155-000CN
11	Gear, 39T/31T	1	RS6-0154-000CN	RS6-0154-000CN	RS6-0154-000CN
12	Gear, 49T	1	RS6-0153-000CN	RS6-0153-000CN	RS6-0153-000CN
13	Gear, 18T	1	RS6-0139-000CN	RS6-0139-000CN	RS6-0139-000CN

Table 8-12 Paper pick-up assembly (3 of 3) (continued)

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
14	Clutch (CL4), electromagnetic	1	RH7-5180-000CN	RH7-5180-000CN	RH7-5180-000CN
15	Gear, 16T	1	RS6-0151-000CN	RS6-0151-000CN	RS6-0151-000CN
16	Clutch (CL3), electromagnetic	1	RH7-5178-000CN	RH7-5178-000CN	RH7-5178-000CN
17	Gear, 29T	1	RS6-0152-000CN	RS6-0152-000CN	RS6-0152-000CN
18	Paper feed PCB assembly	1	RG5-3810-000CN	RG5-3810-000CN	RG5-3810-000CN
19	ICL cam assembly	1	RG5-3242-000CN	RG5-3242-000CN	RG5-3242-000CN
20	Clutch, one-way	1	RB2-0561-000CN	RB2-0561-000CN	RB2-0561-000CN
21	ITB cam assembly	1	RG5-3241-000CN	RG5-3241-000CN	RG5-3241-000CN
22	Clutch, one-way	1	RB2-0561-000CN	RB2-0561-000CN	RB2-0561-000CN
23	Rowel swing assembly	1	RG5-4696-000CN	RG5-4696-000CN	RG5-4696-000CN
24	Spring tension	1	RS5-2800-000CN	RS5-2800-000CN	RS5-2800-000CN
25	Link rowel	1	RB2-0614-000CN	RB2-0614-000CN	RB2-0614-000CN
26	Transfer assembly, secondary	1	RG5-3235-000CN	RG5-5115-040CN	RG5-5115-040CN
27	Plate support	1	RF5-3124-000CN	(included in #26)	(included in #26)
28	Gear, 26T	1	RS6-0159-000CN	RS6-0159-000CN	RS6-0159-000CN
29	Plate, left	1	RF5-2094-000CN	RF5-2094-000CN	RF5-2094-000CN
30	Cover, plate	2	RB2-1572-000CN	RB2-1572-000CN	RB2-1572-000CN
31	Plate, right	1	RF5-2095-000CN	RF5-2095-000CN	RF5-2095-000CN
32	Spring	1	RS5-2799-000CN	RS5-2799-000CN	RS5-2799-000CN
33	D roller assembly	1	RG5-3225-040CN	RG5-3225-040CN	RG5-3225-040CN

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

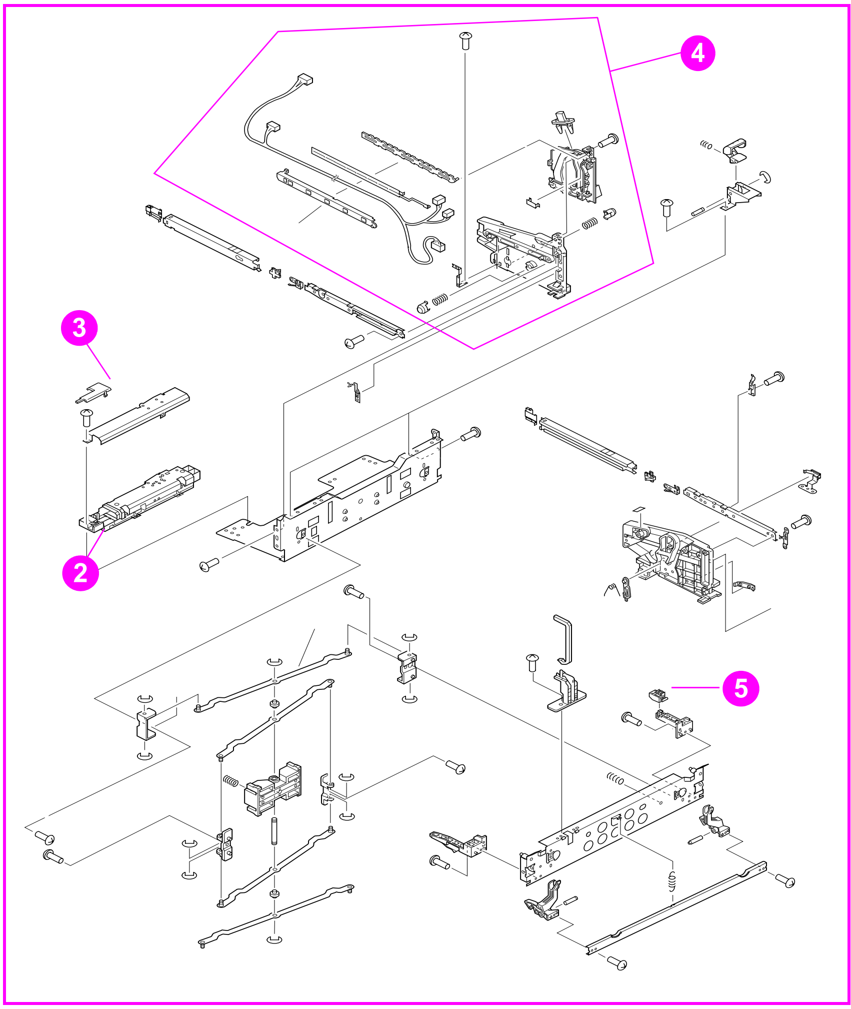

Figure 8-13 Upper drawer assembly

Table 8-13 Upper drawer assembly

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Drum drawer assembly	1	RG5-5230-000CN	RG5-5142-050CN	RG5-5142-050CN
2	Sensor (PS14), density	1	RG5-3281-000CN	RG5-5149-000CN	RG5-5149-000CN
3	Cover, connector	1	RB2-0916-000CN	RB2-0916-000CN	RB2-0916-000CN
4	Connector assembly	1	RG5-5146-000CN	Rg5-5146-000CN	RG5-5146-000CN
5	Bushing, drum drawer	1	RB2-1130-000CN	RB2-1130-000CN	RB2-1130-000CN

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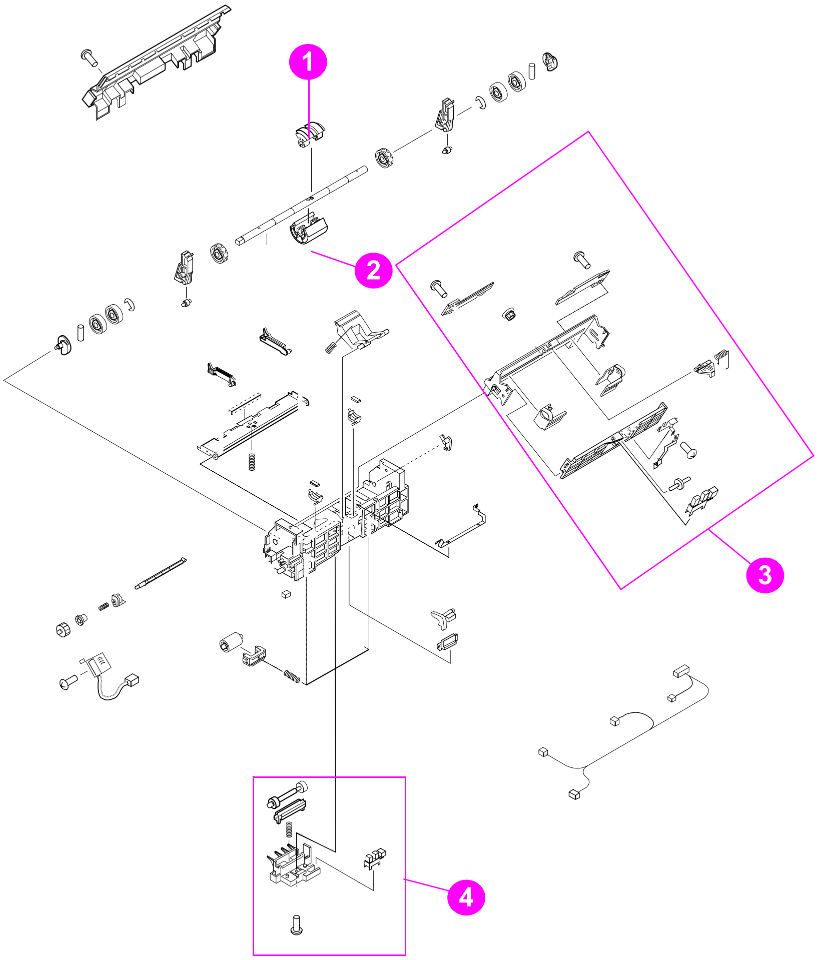

Figure 8-14 MP tray paper pick-up assembly

Table 8-14 MP tray paper pick-up assembly

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Roller	1	RB2-0717-000CN	RB2-0717-000CN	RB2-0717-000CN
2	Roller	1	RB2-0744-000CN	RB2-0744-000CN	RB2-0744-000CN
3	Sensor (PS3) assembly, last paper	1	RG5-5130-020CN	RG5-5130-020CN	RG5-5130-020CN
4	Sensor (PS4) assembly, multi-purpose tray paper	1	RG5-5129-000CN	RG5-5129-000CN	RG5-5129-000CN

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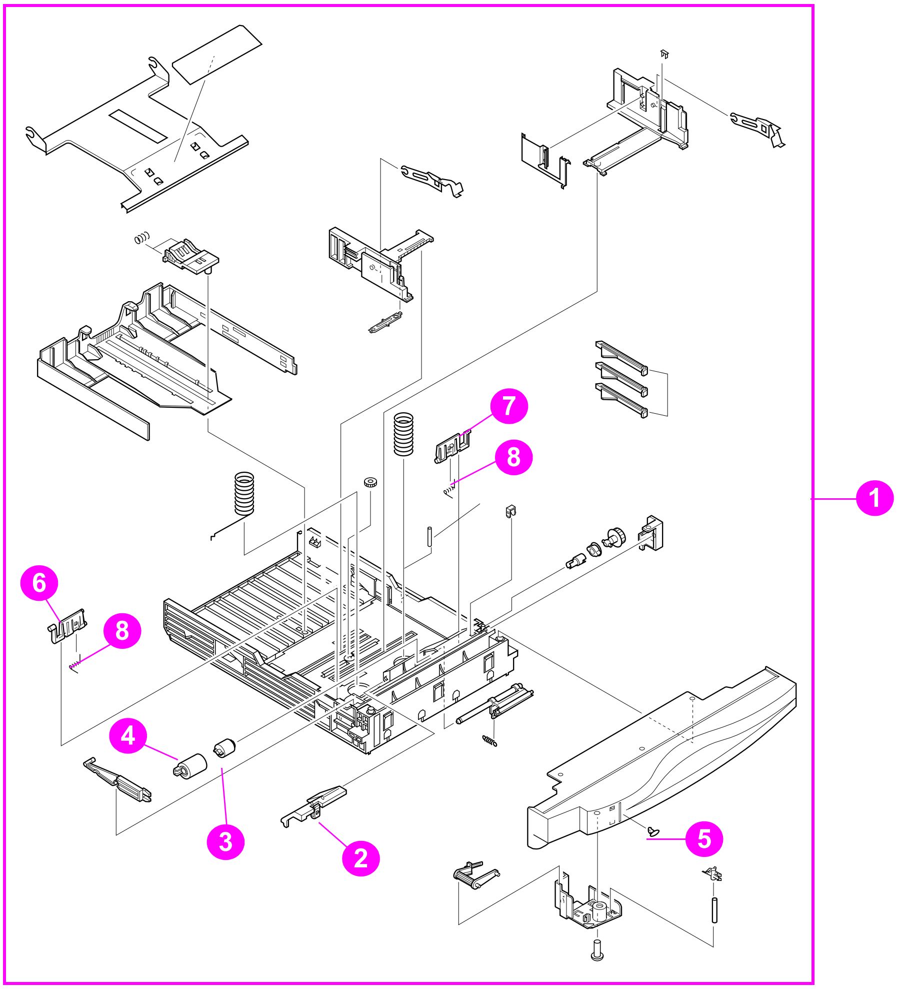

Figure 8-15 **250-sheet cassette**

Table 8-15 250-sheet cassette

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Cassette, 250-sheet	1	RG5-3400-210CN	RG5-3400-210CN	RG5-3400-210CN
2	Cover, roller	1	RB1-9001-000CN	RB1-9001-000CN	RB1-9001-000CN
3	Limiter, torque	1	RB1-8974-000CN	RB1-8974-000CN	RB1-8974-000CN
4	Roller, separation	1	RF5-1885-000CN	RF5-1885-000CN	RF5-1885-000CN
5	Indicator, paper level	1	RB1-9009-020CN	RB1-9009-020CN	RB1-9009-020CN
6	Arm, lifter, left	1	RB1-9012-000CN	RB1-9012-000CN	RB1-9012-000CN
7	Arm, lifter, right	1	RB1-9013-000CN	RB1-9013-000CN	RB1-9013-000CN
8	Spring, torsion	2	RB1-9016-000CN	RB1-9016-000CN	RB1-9016-000CN

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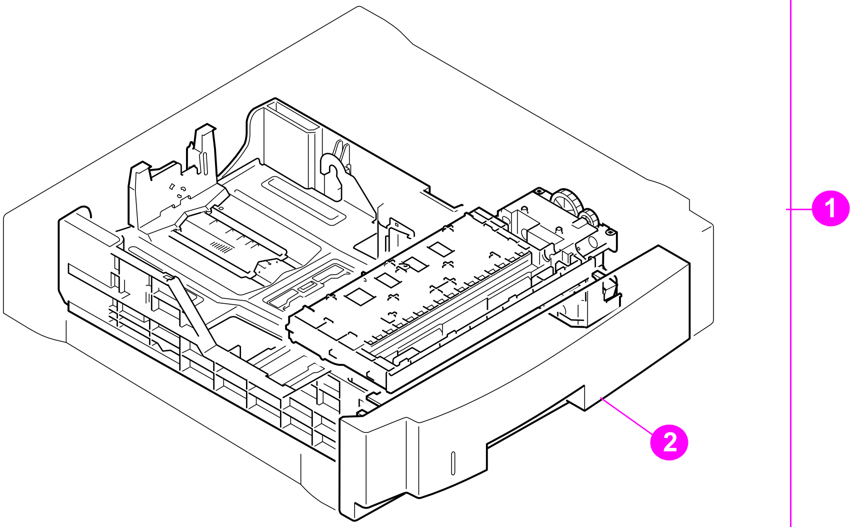

Figure 8-16 500-sheet paper feeder

Table 8-16 500-sheet paper feeder

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	500-sheet paper feeder	1	C4082-67901	C4082-67901	C4082-67901
2	500-sheet paper cassette	1	RG5-3900-000CN	RG5-3900-000CN	RG5-3900-000CN
	Roller, separation	1	RF5-1885-000CN	RF5-1885-000CN	RF5-1885-000CN

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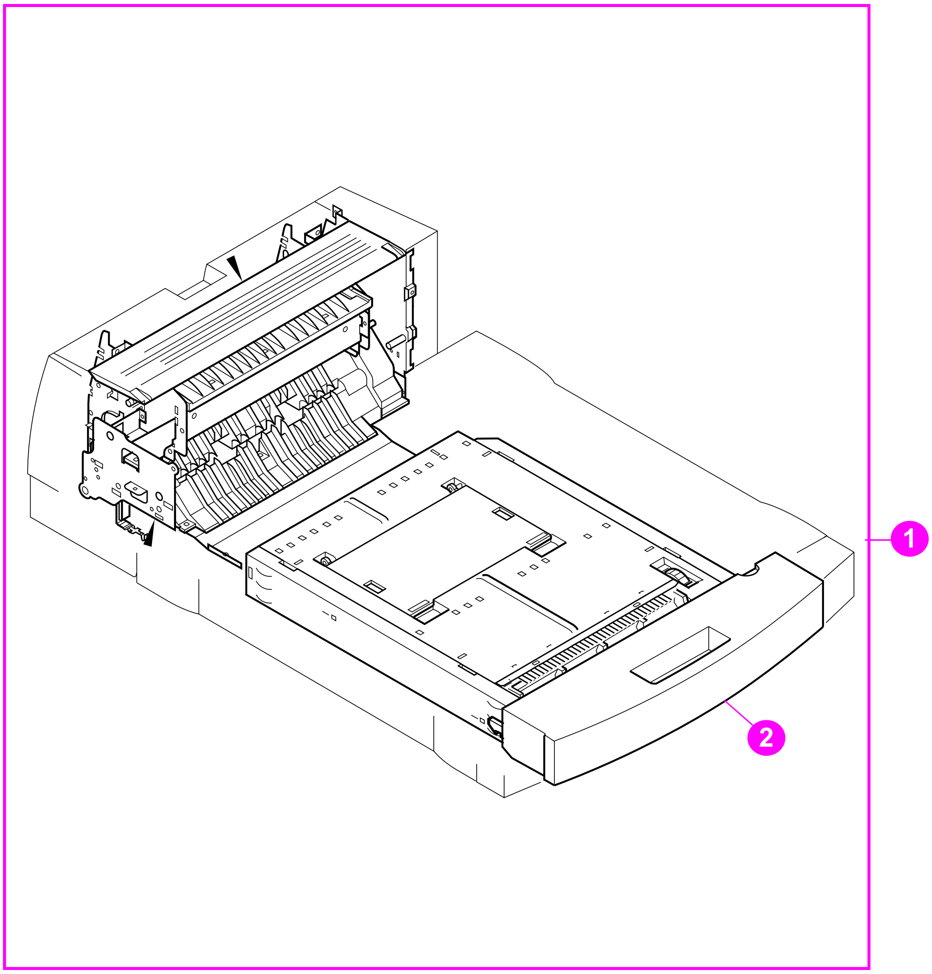

Figure 8-17 **Duplex unit**

Table 8-17 Duplex unit

Ref.	Description	Qty.	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for 4550 series
1	Duplex unit	1	C4083-67901	C4083-67901	C4083-67901
2	Duplexing feeder assembly	1	RG5-4055-000CN	RG5-4055-000CN	RG5-4055-000CN

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329.

Alphabetical parts list

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

Table 8-18 Alphabetical parts list

Description	Parts for 4500 series xx*G*... and below	Parts for 4500 series xx*H*... and above	Parts for HP Color LaserJet 4550 printer	Figure	Reference
500-sheet paper cassette	RG5-3900-000CN	RG5-3900-000CN	RG5-3900-000CN	8-18	2
500-sheet paper feeder	C4082-67901	C4082-67901	C4082-67901	8-18	1
Arm, lifter, left	RB1-9012-000CN	RB1-9012-000CN	RB1-9012-000CN	8-17	6
Arm, lifter, right	RB1-9013-000CN	RB1-9013-000CN	RB1-9013-000CN	8-17	7
Bearing, carousel	XG9-0361-000CN	XG9-0361-000CN	XG9-0361-000CN	8-11	3
Bushing, drum drawer	RB2-1130-000CN	RB2-1130-000CN	RB2-1130-000CN	8-13	5
Bushing, ITB, left	RB2-1158-000CN	RB2-5185-000CN	RB2-5185-000CN	8-10	6
Bushing	RS5-1293-000CN	RS5-1293-000CN	RS5-1293-000CN	8-13	12
Cable, fusing connector	RG5-3886-000CN	RG5-3886-000CN	RG5-3886-000CN	8-11	7
Cable, control panel	RG5-3802-000CN	RG5-5195-000CN	RG5-5195-000CN	8-6	4
Cable, developer	RG5-3783-000CN	RG5-5187-000CN	RG5-5187-000CN	8-8	2
Cable, fan	RG5-3887-000CN	N/A	N/A	8-8	1
Cable, fan	RG5-4650-000CN	RG5-4650-000CN	RG5-4650-000CN	8-10	4
Cable, fusing/option	RG5-3787-000CN	RG5-3787-000CN	RG5-3787-000CN	8-14	1
Cable, ITB	RG5-3786-000CN	RG5-3786-000CN	RG5-3786-000CN	8-10	7
Cable, ITB switch	RG5-4651-000CN	RG5-4651-000CN	RG5-4651-000CN	8-12	1
Cable, laser	RG5-3782-000CN	RG5-3782-000CN	RG5-3782-000CN	8-10	10
Cable, laser (flat)	RH2-5334-000CN	RH2-5334-000CN	RH2-5334-000CN	8-10	11
Cable, main	RG5-3781-000CN	RG5-5186-000CN	RG5-5186-000CN	8-9	4
Cable, paper feed	RG5-3785-000CN	RG5-3785-000CN	RG5-3785-000CN	8-13	28
Cable, rotary	RG5-3795-000CN	RG5-3795-000CN	RG5-3795-000CN	8-11	8
Cable, toner level sensor	N/A	N/A	RG5-5247-000CN	8-11	16
Cable, video interface	RH2-5335-000CN	RH2-5335-000CN	RH2-5335-000CN	8-9	1
Cap, toner flap	RB2-0964-000CN	N/A	N/A	8-11	13
Carousel assembly	RG5-5249-000CN	RG5-5249-000CN	RG5-5249-000CN	8-11	11
Carousel brake assembly	RG5-3309-000CN	RG5-5163-000CN	RG5-5163-000CN	8-10	12
Carousel drive assembly	RG5-5209-000CN	RG5-5209-000CN	RG5-5209-000CN	8-11	6
Cassette, 250-sheet	RG5-3400-210CN	RG5-3400-210CN	RG5-3400-210CN	8-17	1
Clutch (CL2), electromagnetic	RH7-5176-000CN	RH7-5176-000CN	RH7-5176-000CN	8-13	31
Clutch (CL3), electromagnetic	RH7-5178-000CN	RH7-5178-000CN	RH7-5178-000CN	8-14	16
Clutch (CL4), electromagnetic	RH7-5180-000CN	RH7-5180-000CN	RH7-5180-000CN	8-14	14
Clutch, one-way	RB2-0572-000CN	RB2-0572-000CN	RB2-0572-000CN	8-14	3
Clutch, one-way	RB2-0561-000CN	RB2-0561-000CN	RB2-0561-000CN	8-14	20
Clutch, one-way	RB2-0561-000CN	RB2-0561-000CN	RB2-0561-000CN	8-14	22
Cone	RS5-1341-000CN	RS5-1341-OOOCN	RS5-1341-OOOCN	8-13	34
Connector	RF5-2152-000CN	RF5-2152-000CN	RF5-2152-000CN	8-15	4
Continuous toner level sensor PCB	N/A	N/A	RG5-5247-000CN	8-9	15
Control panel assembly	RG5-3345-000CN	RG5-3345-000CN	RG5-3345-000CN	8-6	5
Cover, cable	RB2-1180-000CN	RB2-1180-000CN	RB2-1180-000CN	8-10	5
Cover, connector	RB2-1224-000CN	RB2-1224-000CN	RB2-1224-000CN	8-6	2

Description	**Parts for 4500 series xx*G*... and below**	**Parts for 4500 series xx*H*... and above**	**Parts for HP Color LaserJet 4550 printer**	**Figure**	**Reference**
Cover, connector	RB2-0916-000CN	RB2-0916-000CN	RB2-0916-000CN	8-15	3
Cover, drum drawer	RG5-3315-000CN	RG5-5152-000CN	RG5-5152-000CN	8-6	8
Cover, ITB drawer	RG5-3320-000CN	RG5-3320-000CN	RG5-3320-000CN	8-6	6
Cover, left side	RG5-3313-000CN	RG5-5151-000CN	RG5-5151-000CN	8-6	9
Cover, lower rear	RB2-1206-000CN	RB2-1206-000CN	RB2-1206-000CN	8-6	10
Cover, plate	RB2-1572-000CN	RB2-1572-000CN	RB2-1572-000CN	8-14	30
Cover, rear	RB2-1205-000CN	RB2-1205-000CN	RB2-1205-000CN	8-6	12
Cover, right front	RG5-3310-000CN	RG5-3310-000CN	RG5-3310-000CN	8-6	3
Cover, right side	RB2-1203-000CN	RB2-1203-000CN	RB2-1203-000CN	8-6	1
Cover, roller	RB1-9001-000CN	RB1-9001-000CN	RB1-9001-000CN	8-17	2
Cover, toner access	RF5-2076-000CN	RF5-3137-000CN	RF5-3137-000CN	8-7	2
Cover, top	RG5-3300-000CN	RG5-5150-000CN	RG5-5150-000CN	8-7	1
DC controller PCB	RG5-3809-000CN	RG5-5254-000CN	RG5-5254-000CN	8-5	2
DC controller PCB	RG5-3809-000CN	RG5-5254-000CN	RG5-5254-000CN	8-10	3
Developing PCB	RG5-3811-000CN	RG5-5180-000CN	RG5-5180-000CN	8-5	1
Developing PCB	RG5-3811-000CN	RG5-5180-000CN	RG5-5180-000CN	8-11	5
Door switch assembly	RG5-5170-000CN	RG5-5170-000CN	RG5-5170-000CN	8-10	14A/B
Door, rear access	RG5-3325-040CN	RG5-3325-040CN	RG5-3325-040CN	8-6	11
Drawer switch assembly	RG5-3296-040CN	RG5-3296-030CN	RG5-3296-030CN	8-10	8
Drum bushing assembly	RG5-3319-000CN	RG5-3319-000CN	RG5-3319-000CN	8-8	13
Drum drawer assembly	RG5-5230-000CN	RG5-5142-000CN	RG5-5142-000CN	8-9	6
Drum drawer assembly	RG5-5230-000CN	RG5-5142-000CN	RG5-5142-000CN	8-15	1
Drum drive assembly	RG5-3170-000CN	RG5-3170-000CN	RG5-3170-000CN	8-9	7
Duplex unit	C4083-67901	C4083-67901	C4083-67901	8-19	1
Duplexing feeder assembly	RG5-4055-000CN	RG5-4055-000CN	RG5-4055-000CN	8-19	2
Face-down delivery assembly	RG5-5135-000CN	RG5-5135-000CN	RG5-5135-000CN	8-8	16
Fan, large	RH7-1346-000CN	RH7-1435-000CN	RH7-1435-000CN	8-11	1
Fan, small	RH7-1407-000CN	RH7-1407-000CN	RH7-1407-000CN	8-8	10
Feeder assembly	RG5-3226-000CN	RG5-5117-000CN	RG5-5117-000CN	8-12	5
Filter, air (large)	RB2-1282-000CN	RB2-1282-000CN	RB2-1282-000CN	8-8	17
Filter, air (small)	RB2-1283-000CN	RB2-1283-000CN	RB2-1283-000CN	8-8	9
Firmware DIMM	C4084-60004	C4084-60004	C9130-60004	8-5	7
Formatter PCB	C4084-69001	C4084-69001	C4227-69001	8-5	6
Fuser, 110V	RG5-5154-000CN C4084-69002*	RG5-5154-000CN C4084-69002*	RG5-5154-000CN C4084-69002*	8-8	11
Fuser, 220V	RG5-5155-000CN C4084-69003*	RG5-5155-000CN C4084-69003*	RG5-5155-000CN C4084-69003*	8-8	11
Gear assembly	RG5-3228-000CN	RG5-3228-000CN	RG5-3228-000CN	8-14	9
Gear, 125T	RS6-0176-000CN	RS6-0176-000CN	RS6-0176-000CN	8-11	4
Gear, 16T	RS6-0151-000CN	RS6-0151-000CN	RS6-0151-000CN	8-14	15
Gear, 17T	RS6-0158-000CN	RS6-0158-000CN	RS6-0158-000CN	8-13	1
Gear, 17T	RS6-0158-000CN	RS6-0158-000CN	RS6-0158-000CN	8-13	4
Gear, 18T	RS6-0140-000CN	RS6-0140-000CN	RS6-0140-000CN	8-13	6
Gear, 18T	RS6-0139-000CN	RS6-0139-000CN	RS6-0139-000CN	8-14	4
Gear, 18T	RS6-0139-000CN	RS6-0139-000CN	RS6-0139-000CN	8-14	13
Gear, 18T/14T	RS6-0157-000CN	RS6-0157-000CN	RS6-0157-000CN	8-13	2
Gear, 18T/52T	RF5-2161-000CN	RF5-2161-000CN	RF5-2161-000CN	8-13	22
Gear, 19T	RS6-0141-000CN	RS6-0141-000CN	RS6-0141-000CN	8-13	7
Gear, 20T	RS6-0138-000CN	RS6-0138-000CN	RS6-0138-000CN	8-13	18
Gear, 24T/37T	RS6-0163-000CN	RS6-0163-000CN	RS6-0163-000CN	8-13	16

Description	**Parts for 4500 series xx*G*... and below**	**Parts for 4500 series xx*H*... and above**	**Parts for HP Color LaserJet 4550 printer**	**Figure**	**Reference**
Gear, 26T	RS6-0149-000CN	RS6-0149-000CN	RS6-0149-000CN	8-13	25
Gear, 26T	RS6-0159-000CN	RS6-0159-000CN	RS6-0159-000CN	8-14	28
Gear, 26T/18T	RS6-0137-000CN	RS6-0137-000CN	RS6-0137-000CN	8-14	8
Gear, 27T	RS6-0135-000CN	RS6-0135-000CN	RS6-0135-000CN	8-13	9
Gear, 27T	RS6-0135-000CN	RS6-0135-000CN	RS6-0135-000CN	8-13	10
Gear, 29T	RS6-0150-000CN	RS6-0150-000CN	RS6-0150-000CN	8-13	29
Gear, 29T	RS6-0150-000CN	RS6-0150-000CN	RS6-0150-000CN	8-13	30
Gear, 29T	RS6-0152-000CN	RS6-0152-000CN	RS6-0152-000CN	8-14	17
Gear, 29T/17T	RS6-0145-000CN	RS6-0145-000CN	RS6-0145-000CN	8-13	21
Gear, 30T/16T	RS6-0134-000CN	RS6-0134-000CN	RS6-0134-000CN	8-13	11
Gear, 31T	RS6-0136-000CN	RS6-0136-000CN	RS6-0136-000CN	8-13	13
Gear, 34T/15T	RS6-0144-000CN	RS6-0144-000CN	RS6-0144-000CN	8-13	20
Gear, 35T	RS6-0132-000CN	RS6-0132-000CN	RS6-0132-000CN	8-13	17
Gear, 37T	RS6-0143-000CN	RS6-0143-000CN	RS6-0143-000CN	8-13	26
Gear, 37T/14T	RS6-0133-000CN	RS6-0133-000CN	RS6-0133-000CN	8-13	19
Gear, 39T/31T	RS6-0154-000CN	RS6-0154-000CN	RS6-0154-000CN	8-14	11
Gear, 47T	RS6-0147-000CN	RS6-0147-000CN	RS6-0147-000CN	8-13	15
Gear, 49T	RS6-0153-000CN	RS6-0153-000CN	RS6-0153-000CN	8-14	12
Gear, 52T	RS6-0146-000CN	RS6-0146-000CN	RS6-0146-000CN	8-13	23
Gear, 53T	RS6-0155-000CN	RS6-0155-000CN	RS6-0155-000CN	8-14	10
Gear, 53T/46T	RS6-0156-000CN	RS6-0156-000CN	RS6-0156-000CN	8-13	3
Guide, cable	RB2-1277-000CN	RB2-1277-000CN	RB2-1277-000CN	8-9	3
Guide, cable, lower	RB2-1456-000CN	RB2-1456-000CN	RB2-1456-000CN	8-10	13
Guide, upper drum drawer cable	RB2-1457-000CN	N/A	N/A	8-10	1
Handle, ITB drawer	RB2-1361-000CN	RB2-1361-000CN	RB2-1361-000CN	8-8	8
High-voltage power supply	RG5-3285-000CN	RG5-5165-000CN	RG5-5165-000CN	8-8	4
ICL cam assembly	RG5-3242-000CN	RG5-3242-000CN	RG5-3242-000CN	8-14	19
Indicator, paper level	RB1-9009-000CN	RB1-9009-000CN	RB1-9009-000CN	8-17	5
Interconnect PCB	RG5-3808-000CN	RG5-3808-000CN	RG5-3808-000CN	8-5	3
Interconnect PCB	RG5-3808-000CN	RG5-3808-000CN	RG5-3808-000CN	8-9	2
I/O card	C4081-60001	C4081-60001	C4207-60001	8-5	8
ITB assembly	RG5-5173-000CN	RG5-5173-000CN	RG5-5173-000CN	8-8	6
ITB cam assembly	RG5-3241-000CN	RG5-3241-000CN	RG5-3241-000CN	8-14	21
ITB drawer assembly	RG5-5120-100CN	RG5-5120-100CN	RG5-5120-100CN	8-8	7
ITB drawer connector	VS1-6174-014CN	VS1-6174-014CN	VS1-6174-014CN	8-12	6
Kit, carousel flap	C4084-67909	C4084-67907	C4084-67907	8-11	14
Kit, fuser deflector	C4084-67906	C4084-67906	C4084-67906	8-8	12
Kit, imaging drum drawer	RG5-5230-000CN	N/A	N/A	Not shown	
Laser/scanner assembly	RG5-5175-000CN	RG5-5175-000CN	RG5-5175-000CN	8-10	9
Lever, sensor	RB2-0576-000CN	RB2-0576-000CN	RB2-0576-000CN	8-14	2
Limiter, torque	RB1-8974-000CN	RB1-8974-000CN	RB1-8974-000CN	8-17	3
Link rowel	RB2-0614-000CN	RB2-0614-000CN	RB2-0614-000CN	8-14	25
Metal tab, Tray 2	RB2-0593-000CN	RB2-0593-000CN	RB2-0593-000CN	8/11	35
Microswitch	WC2-5330-000CN	WC2-5330-000CN	WC2-5330-000CN	8-10	7
Microswitch, ITB	WC2-5330-000CN	WC2-5330-000CN	WC2-5330-000CN	8-12	2
Motor (M1), fusing assembly	RG5-3227-000CN	RG5-3227-000CN	RG5-3227-000CN	8-13	24
Motor(M2), pick-up	RH7-1343-000CN	RH7-1343-000CN	RH7-1343-000CN	8-13	14
Paper feed PCB	RG5-3810-000CN	RG5-3810-000CN	RG5-3810-000CN	8-5	5
Paper feed PCB assembly	RG5-3810-000CN	RG5-3810-000CN	RG5-3810-000CN	8-14	18
Paper size sensor PCB	RG5-3816-000CN	RG5-3816-000CN	RG5-3816-000CN	8-5	4

Description	**Parts for 4500 series xx*G*... and below**	**Parts for 4500 series xx*H*... and above**	**Parts for HP Color LaserJet 4550 printer**	**Figure**	**Reference**
Plate, left	RF5-2094-000CN	RF5-2094-000CN	RF5-2094-000CN	8-14	29
Plate, right	RF5-2095-000CN	RF5-2095-000CN	RF5-2095-000CN	8-14	31
Plate support	RF5-2138-000CN	N/A	N/A	8-14	27
Power supply, 110V	RH3-2219-000CN	RH3-2219-000CN	RH3-2219-000CN	8-8	3
Power supply, 220V	RH3-2220-000CN	RH3-2220-000CN	RH3-2220-000CN	8-8	3
Rod, delivery	RB2-1284-000CN	RB2-1284-000CN	RB2-1284-000CN	8-8	14
Roller	RF5-2092-000CN	RF5-2092-000CN	RF5-2092-000CN	8-13	5
Roller	RB2-0717-000CN	RB2-0717-000CN	RB2-0717-000CN	8-16	1
Roller	RB2-0744-000CN	RB2-0744-000CN	RB2-0744-000CN	8-16	2
Roller, paper pick	RB1-8865-000CN	RB1-8865-000CN	RB1-8865-000CN	8-14	5
Roller, separation	RF5-1885-000CN	RF5-1885-000CN	RF5-1885-000CN	8-17	4
Roller, separation	RF5-1885-000CN	RF5-1885-000CN	RF5-1885-000CN	8-18	
Roller, transfer	RF5-2112-000CN	RF5-2112-000CN	RF5-2112-000CN	8-9	5
Rowel swing assembly	RG5-4696-000CN	RG5-4696-000CN	RG5-4696-000CN	8-14	23
Sensor (PS3), last paper	WG8-5364-000CN	WG8-5364-000CN	WG8-5364-000CN	8-16	3
Sensor (PS4), multi-purpose tray paper	WG8-5309-000CN	WG8-5309-000CN	WG8-5309-000CN	8-16	4
Sensor (PS6), fusing unit pressure release	WG8-5309-000CN	WG8-5309-000CN	WG8-5309-000CN	8-12	4
Sensor (PS7), delivery paper	FH7-7313-000CN	FH7-7313-000CN	FH7-7313-000CN	8-12	3
Sensor (PS8), cassette paper	WG8-5309-000CN	WG8-5309-000CN	WG8-5309-000CN	8-13	32
Sensor (PS10), carousel position	WG8-5362-000CN	WG8-5362-000CN	WG8-5362-000CN	8-11	10
Sensor, continuous toner level	N/A	N/A	RG5-5247-000CN		
Sensor (PS12), toner level	RG5-3355-000CN	RG5-3355-000CN	RG5-3355-000CN	8-11	9
Sensor (PS13), waste toner	RG5-3292-000CN	RG5-3292-000CN	RG5-3292-000CN	8-10	2
Sensor (PS14), density	RG5-3281-000CN	RG5-5149-000CN	RG5-5149-000CN	8-15	2
Sensor, paper size	RG5-3234-000CN	RG5-3234-000CN	RG5-3234-000CN	8-13	27
Shaft, paper pick	RB2-0545-000CN	RB2-0545-000CN	RB2-0545-000CN	8-14	6
Solenoid, Tray 2 feed (SL2)	RG5-3245-000CN	RG5-5119-000CN	RG5-5119-000CN	8-13	8
Spacer	RS5-6210-000CN	RS5-6210-000CN	RS5-6210-000CN	8-11	2
Spring, grounding	RB2-0981-000CN	RB2-0981-000CN	RB2-0981-000CN		
Spring tension	RS5-2800-000CN	RS5-2800-000CN	RS5-2800-000CN	8-14	24
Spring, tension	RS5-2754-000CN	RS5-2754-000CN	RS5-2754-000CN	8-8	15
Spring, toner flap	RS5-2739-000CN	RS5-2739-000CN	RS5-2739-000CN	8-11	12
Spring, torsion	RB1-9016-000CN	RB1-9016-000CN	RB1-9016-000CN	8-17	8
Spring, Tray 2 pickup tension	RS5-2794-000CN	RS5-2794-000CN	RS5-2794-000CN	8-13	33
Strap, cover support	RB2-1556-000CN	RB2-1556-000CN	RB2-1556-000CN	8-8	5
Transfer assembly, secondary	RG5-3235-000CN	RG5-5115-000CN	RG5-5115-000CN	8-14	26
Transfer cam assembly	RG5-3240-000CN	RG5-5118-000CN	RG5-5118-000CN	8-14	7
Tray, extension	RB2-1215-000CN	RB2-1215-000CN	RB2-1215-000CN	8-6	7

*These parts require exchange

Numerical parts list

CAUTION Two versions of the HP Color LaserJet 4500 series printers are available. Before ordering parts, you will need to identify which printer version you are servicing. For more information, see page 329. The 4550 series has some different service parts from the 4500 series.

Table 8-19 Numerical parts list

Part number	Description	Figure	Reference
C4081-60001	I/O Card (4500 only)	8-3	8
C4082-67901	500-sheet paper feeder	8-16	1
C4083-67901	Duplex unit	8-17	1
C4084-60004	Firmware DIMM (4500 only)	8-3	6
C4084-67906	Kit, fuser deflector	8-6	12
C4084-67907	Kit, carousel flap	8-9	14
C4084-69004	Formatter PCB (4500)	8-3	6
C4084-69002*	Fuser, 110V	8-6	11
C4084-69003*	Fuser, 220V	8-6	11
C4207-60001	I/O card	8-3	8
C4227-69001*	Formatter PCB (4550 only)	8-3	6
C9130-60001	Firmware DIMM	8-3	7
	Cap, toner flap	8-9	13
	Cable, fan	8-6	1
	Bearing, carousel	8-9	3
FH7-7313-000CN	Sensor (PS7), delivery paper	8-10	3
RB1-8865-000CN	Roller, paper pick	8-12	5
RB1-8974-000CN	Limiter, torque	8-15	3
RB1-9001-000CN	Cover, roller	8-15	2
RB1-9009-000CN	Indicator, paper level	8-15	5
RB1-9012-000CN	Arm, lifter, left	8-15	6
RB1-9013-000CN	Arm, lifter, right	8-15	7
RB1-9016-000CN	Spring, torsion	8-15	8
RB2-0545-000CN	Shaft, paper pick	8-12	6
RB2-0561-000CN	Clutch, one-way	8-12	20
RB2-0561-000CN	Clutch, one-way	8-12	22
RB2-0572-000CN	Clutch, one-way	8-12	3
RB2-0576-000CN	Lever, sensor	8-12	2
RB2-0593-000CN	Metal tab, Tray 2	8-11	35
RB2-0614-000CN	Link rowel	8-12	25
RB2-0717-000CN	Roller	8-14	1
RB2-0744-000CN	Roller	8-14	2
RB2-0916-000CN	Cover, connector	8-13	3

Table 8-19 Numerical parts list

Part number	Description	Figure	Reference
RB2-0964-000CN	Cap, toner flap	8-9	13
RB2-0981-000CN	Spring, grounding	8-9	17
RB2-1130-000CN	Bushing, drum drawer	8-13	5
RB2-1158-000CN	Bushing, ITB, left	8-8	6
RB2-1180-000CN	Cover, cable	8-8	5
RB2-1203-000CN	Cover, right side	8-4	1
RB2-1205-000CN	Cover, rear	8-4	12
RB2-1206-000CN	Cover, lower rear	8-4	10
RB2-1215-000CN	Tray, extension	8-4	7
RB2-1224-000CN	Cover, connector	8-4	2
RB2-1277-000CN	Guide, cable	8-7	3
RB2-1282-000CN	Filter, air (large)	8-6	17
RB2-1283-000CN	Filter, air (small)	8-6	9
RB2-1284-000CN	Rod, delivery	8-6	14
RB2-1361-000CN	Handle, ITB drawer	8-6	8
RB2-1456-000CN	Guide, cable, lower	8-8	13
RB2-1457-000CN	Guide, upper drum drawer cable	8-8	1
RB2-1556-000CN	Strap, cover support	8-6	5
RB2-5185-000CN	Bushing, ITB, left	8-8	6
RF5-1885-000CN	Roller, separation	8-15	4
RF5-1885-000CN	Roller, separation	8-16	
RF5-2076-000CN	Cover, toner access	8-5	2
RF5-2092-000CN	Roller	8-11	5
RF5-2112-000CN	Roller, transfer	8-7	5
RF5-2138-000CN	Plate support	8-12	27
RF5-2152-000CN	Connector	8-13	4
RF5-2161-000CN	Gear, 18T/52T	8-11	22
RF5-3137-000CN	Cover, toner access	8-5	2
RG5-3170-000CN	Drum drive assembly	8-7	7
RG5-3226-000CN	Feeder assembly	8-10	5
RG5-3227-000CN	Motor (M1), fusing assembly	8-11	24
RG5-3228-000CN	Gear assembly	8-12	9
RG5-3234-000CN	Sensor, paper size	8-11	27
RG5-3235-000CN	Transfer assembly, secondary	8-12	26
RG5-3240-000CN	Transfer cam assembly	8-12	7
RG5-3241-000CN	ITB cam assembly	8-12	21
RG5-3242-000CN	ICL cam assembly	8-12	19
RG5-3245-000CN	Solenoid, Tray 2 feed (SL2)	8-11	8
RG5-3281-000CN	Sensor (PS14), density	8-13	2
RG5-3285-000CN	High-voltage power supply	8-6	4

Table 8-19 Numerical parts list

Part number	Description	Figure	Reference
RG5-3292-000CN	Sensor (PS13), waste toner	8-8	2
RG5-3296-030CN	Drawer switch assembly	8-8	8
RG5-3300-000CN	Cover, top	8-5	1
RG5-3309-000CN	Carousel brake assembly	8-8	12
RG5-3310-000CN	Cover, right front	8-4	3
RG5-3313-000CN	Cover, left side	8-4	9
RG5-3319-000CN	Drum bushing assembly	8-6	13
RG5-3320-000CN	Cover, ITB drawer	8-4	6
RG5-3325-040CN	Door, rear access	8-4	11
RG5-3345-000CN	Control panel assembly	8-4	5
RG5-3355-000CN	Sensor (PS12), toner assembly	8-9	9
RG5-3400-210CN	Cassette, 250-sheet	8-15	1
RG5-3781-000CN	Cable, main	8-7	4
RG5-3782-000CN	Cable, laser	8-8	10
RG5-3783-000CN	Cable, developer	8-6	2
RG5-3785-000CN	Cable, paper feed	8-11	28
RG5-3786-000CN	Cable, ITB	8-10	7
RG5-3787-000CN	Cable, fusing/option	8-12	1
RG5-3795-000CN	Cable, rotary	8-9	8
RG5-3802-000CN	Cable, control panel	8-4	4
RG5-3808-000CN	Interconnect PCB	8-3	3
RG5-3808-000CN	Interconnect PCB	8-7	2
RG5-3809-000CN	DC controller PCB	8-8	3
RG5-3810-000CN	Paper feed PCB	8-3	5
RG5-3810-000CN	Paper feed PCB assembly	8-12	18
RG5-3811-000CN	Developing PCB	8-3	1
RG5-3811-000CN	Developing PCB	8-9	5
RG5-3816-000CN	Paper size sensor PCB	8-3	4
RG5-3886-000CN	Cable, fusing connector	8-9	7
RG5-3887-000CN	Cable, fan	8-6	1
RG5-3900-000CN	500-sheet paper cassette	8-16	2
RG5-4055-000CN	Duplexing feeder assembly	8-17	2
RG5-4650-000CN	Cable, fan	8-8	4
RG5-4651-000CN	Cable, ITB switch	8-10	1
RG5-4696-000CN	Rowel swing assembly	8-12	23
RG5-5115-000CN	Transfer assembly, secondary	8-12	26
RG5-5117-000CN	Feeder assembly	8-10	5
RG5-5118-000CN	Transfer cam assembly	8-12	7
RG5-5119-000CN	Solenoid, Tray 2 feed (SL2)	8-11	8
RG5-5120-100CN	ITB drawer assembly	8-6	7

Table 8-19 Numerical parts list

Part number	Description	Figure	Reference
RG5-5135-000CN	Face-down delivery assembly	8-6	16
RG5-5142-000CN	Drum drawer assembly	8-7	6
RG5-5142-000CN	Drum drawer assembly	8-13	1
RG5-5149-000CN	Sensor (PS14), density	8-13	2
RG5-5150-000CN	Cover, top	8-5	1
RG5-5151-000CN	Cover, left side	8-4	9
RG5-5152-000CN	Cover, drum drawer	8-4	8
RG5-5154-000CN	Fuser, 110V	8-6	11
RG5-5155-000CN	Fuser, 220V	8-6	11
RG5-5163-000CN	Carousel brake assembly	8-8	12
RG5-5165-000CN	High-voltage power supply	8-6	4
RG5-5170-000CN	Door switch assembly	8-8	14B
RG5-5173-000CN	ITB assembly	8-6	6
RG5-5175-000CN	Laser/scanner assembly	8-8	9
RG5-5180-000CN	Developing PCB	8-3	1
RG5-5180-000CN	Developing PCB	8-9	5
RG5-5186-000CN	Cable, main	8-7	4
RG5-5187-000CN	Cable, developer	8-6	2
RG5-5195-000CN	Cable, control panel	8-4	4
RG5-5209-000CN	Carousel drive assembly	8-9	6
RG5-5230-000CN	Drum drawer assembly	8-7	6
RG5-5230-000CN	Drum drawer assembly	8-13	1
RG5-5230-000CN	Kit, imaging drum drawer	Not shown	
RG5-5232-000CN	Cover, drum drawer	8-4	8
RG5-5247-000CN	Continuous toner level sensor	8-9	15
RG5-5249-000CN	Carousel assembly	8-9	11
RG5-5254-000CN	DC controller PCB	8-3	2
RG5-5254-000CN	DC controller PCB	8-8	3
RG5-5444-000CN	Cable, level sensor	8-9	16
RH2-5334-000CN	Cable, laser (flat)	8-8	11
RH2-5335-000CN	Cable, video interface	8-7	1
RH3-2219-000CN	Power supply, 110V	8-6	3
RH3-2220-000CN	Power supply, 220V	8-6	3
RH7-1343-000CN	Motor (M2), pick-up	8-11	14
RH7-1346-000CN	Fan, large	8-9	1
RH7-1407-000CN	Fan, small	8-6	10
RH7-1435-000CN	Fan, large	8-9	1
RH7-5176-000CN	Clutch (CL2), electromagnetic	8-11	31
RH7-5178-000CN	Clutch (CL3), electromagnetic	8-12	16
RH7-5180-000CN	Clutch (CL4), electromagnetic	8-12	14

Table 8-19 Numerical parts list

Part number	Description	Figure	Reference
RS5-1293-000CN	Bushing	8-11	12
RS5-1341-000CN	Cone	8-11	34
RS5-2739-000CN	Spring, toner flap	8-9	12
RS5-2754-000CN	Spring, tension	8-6	15
RS5-2794-000CN	Spring, Tray 2 pickup tension	8-11	33
RS5-2799-000CN	Spring, tension	8-12	32
RS5-2800-000CN	Spring, tension	8-12	24
RS5-6210-000CN	Spacer	8-9	2
RS6-0132-000CN	Gear, 35T	8-11	17
RS6-0133-000CN	Gear, 37T/14T	8-11	19
RS6-0134-000CN	Gear, 30T/16T	8-11	11
RS6-0135-000CN	Gear, 27T	8-11	9
RS6-0135-000CN	Gear, 27T	8-11	10
RS6-0136-000CN	Gear, 31T	8-11	13
RS6-0137-000CN	Gear, 26T/18T	8-12	8
RS6-0138-000CN	Gear, 20T	8-11	18
RS6-0139-000CN	Gear, 18T	8-12	4
RS6-0139-000CN	Gear, 18T	8-12	13
RS6-0140-000CN	Gear, 18T	8-11	6
RS6-0141-000CN	Gear, 19T	8-11	7
RS6-0143-000CN	Gear, 37T	8-11	26
RS6-0144-000CN	Gear, 34T/15T	8-11	20
RS6-0145-000CN	Gear, 29T/17T	8-11	21
RS6-0146-000CN	Gear, 52T	8-11	23
RS6-0147-000CN	Gear, 47T	8-11	15
RS6-0149-000CN	Gear, 26T	8-11	25
RS6-0150-000CN	Gear, 29T	8-11	29
RS6-0150-000CN	Gear, 29T	8-11	30
RS6-0151-000CN	Gear, 16T	8-12	15
RS6-0152-000CN	Gear, 29T	8-12	17
RS6-0153-000CN	Gear, 49T	8-12	12
RS6-0154-000CN	Gear, 39T/31T	8-12	11
RS6-0155-000CN	Gear, 53T	8-12	10
RS6-0156-000CN	Gear, 53T/46T	8-11	3
RS6-0157-000CN	Gear, 18T/14T	8-11	2
RS6-0158-000CN	Gear, 17T	8-11	1
RS6-0158-000CN	Gear, 17T	8-11	4
RS6-0159-000CN	Gear, 26T	8-12	28
RS6-0163-000CN	Gear, 24T/37T	8-11	16
RS6-0176-000CN	Gear, 125T	8-9	4

Table 8-19 Numerical parts list

Part number	Description	Figure	Reference
VS1-6173-014CN	Connector	not shown	
VS1-6174-014CN	ITB drawer connector	8-10	6
WC2-5330-000CN	Microswitch	8-8	7
WC2-5330-000CN	Microswitch, ITB	8-10	2
WG8-5309-000CN	Sensor (PS8), cassette paper	8-11	32
WG8-5309-000CN	Sensor (PS6), fusing unit pressure release	8-10	4
WG8-5309-000CN	Sensor (PS4), multi-purpose tray paper	8-14	4
WG8-5362-000CN	Sensor (PS10), carousel position	8-9	10
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